

Supplemental Response to CEC Data Request: No. A54

Amended Application for Certification
for
HYDROGEN ENERGY CALIFORNIA
(08-AFC-8A)
Kern County, California

Prepared for:
Hydrogen Energy California LLC



Submitted to:



**California Energy
Commission**



**U.S Department
of Energy**

Prepared by:

URS

May 2013

California Energy Commission

**DOCKETED
08-AFC-8A**

TN # 70654

MAY 06 2013



SUPPLEMENTAL RESPONSE TO DATA REQUEST A54 FROM CALIFORNIA ENERGY COMMISSION (CEC)

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Biological Resources

A54

ATTACHMENTS

Attachment A54-1	CDFW Notification of Lake and Streambed Alteration
Attachment A54-2	CDFW Incidental Take Permit Application
Attachment A54-3	Application for RWQCB 401 Water Quality Certification and Waste Discharge Requirements

LIST OF ACRONYMS AND ABBREVIATIONS USED IN RESPONSES

AFC	Application for Certification
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CVRWQCB	Central Valley Regional Water Quality Control Board
HDD	Horizontal Directional Drilling
HDDP	Horizontal Directional Drilling Plan
HECA	Hydrogen Energy California
ITP	Incidental Take Permit

Technical Area: Biological Resources

Author: Amy Golden

STATE WATERS

BACKGROUND

The California Department of Fish and Game (CDFG) regulates activities that would substantially change, divert, obstruct, or use any material from the bed, channel, or bank of, any river, stream, or lake under Section 1600 of the California Fish and Game Codes. The applicant has indicated that the identified waters may be regulated by the Central Valley Regional Water Quality Control Board (CVRWQCB) but has not provided any data regarding the occurrence of state waters potentially regulated under California Fish and Game Code 1600. CDFG has indicated to staff previously that horizontal directional drilling (HDD) activities beneath canals would require a Lake or Streambed Alteration Agreement and a frac-out Plan. Because the Energy Commission is the lead state permitting authority over the project's impacts to state waters, staff needs additional information on the occurrence of state waters in the project area.

DATA REQUEST

A54. Please provide a map showing the location of delineated state waters. Please also provide the estimated acreage of state jurisdictional waters, project description, estimated impacts, measures to protect fish and wildlife resources for activities occurring in state waters and any other information that would normally be included in a Notification of a Lake or Streambed Alteration to CDFG.

SUPPLEMENTAL RESPONSE

As described in Section 5.2.4 of the 2012 Application for Certification (AFC), measures will be implemented during construction to protect fish and wildlife resources associated with potential waters of the state. These measures are summarized in the three documents listed below:

- Notification of Lake and Streambed Alteration
- Incidental Take Permit (ITP) application
- 401 Water Quality Certification and Waste Discharge Requirements

Each of these documents is described in more detail below.

The Applicant has prepared a Notification of Lake and Streambed Alteration (Notification) in accordance with Sections 1600–1616 of the California Fish and Game Code. The application was submitted to the California Department of Fish and Wildlife (CDFW; formerly California Department of Fish and Game) on May 2, 2013. A copy of the notification is provided in Appendix A54-1.

In support of the CDFW Notification, the Applicant prepared a preliminary Horizontal Directional Drilling Plan (HDDP) that includes a frac-out (unexpected discharges of hydraulic drilling fluid) spill response plan. In the case of a frac-out, any hydraulic fluid that reaches the surface would be contained and removed, resulting only in temporary disturbance. The draft HDDP is provided as Appendix D of the CDFW Notification provided in Appendix A54-1.

The Applicant has prepared an Incidental Take Permit (ITP) application in accordance with the California Endangered Species Act of 1984, Fish and Game Code, §§2050 – 2098. The

application was submitted to the CDFW on May 2, 2013. A copy of the application is provided in Appendix A54-2.

The Applicant has prepared an application for 401 Water Quality Certification and Waste Discharge Requirements for placement of fill in waters of the state in accordance with Section 401 of the Clean Water Act. The application was submitted to the Central Valley Regional Water Quality Control Board on March 25, 2013. A copy of the application is provided in Appendix A54-3.

ATTACHMENT A54-1
CDFW NOTIFICATION OF LAKE AND STREAMBED ALTERATION



May 2, 2013

Julie Vance
Environmental Program Manager
Habitat Conservation Planning
California Department of Fish and Wildlife
Central Region (R4)
1234 E. Shaw Avenue
Fresno, CA 93710

Re: Hydrogen Energy California LLC (HECA) – Notification of Lake and Streambed Alteration

Dear Ms. Vance:

The enclosed Notification of Lake and Streambed Alteration for the Hydrogen Energy California (HECA) Project is submitted for your review on behalf of HECA LLC. The California Energy Commission is currently reviewing the HECA Project for certification, and it is our understanding that CDFW will coordinate its review with the CEC and that action on the Notification of Lake and Streambed Alteration will be integrated into the CEC certification. Consistent with that process, HECA is providing the enclosed Notification for review by CDFW. The Notification addresses actions proposed by HECA as well as related actions proposed by Occidental of Elk Hills, Inc. (OEHI). The enclosed document presents a detailed description of the proposed Project and the areas of potential CDFW jurisdiction that are located within the Project area.

A check in the amount of \$4,482.75 payable to the California Department of Fish and Wildlife is enclosed with this submittal.

We look forward to working with you towards the successful completion of this process. Please contact Steve Leach, at (510) 874-3205 or Jan Novak at (510) 874-1733 regarding the enclosed documents.

Sincerely,

URS Corporation

A handwritten signature in blue ink, appearing to read "Dale Shileikis", is positioned above the printed name.

Dale Shileikis
Project Manager
URS Corporation

Enclosure:
HECA 1602 Notification of Lake and Streambed Alteration (2 copies)

cc: Marisa Mascaro, HECA

FOR DEPARTMENT USE ONLY				
Date Received	Amount Received	Amount Due	Date Complete	Notification No.
	\$	\$		



STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME
NOTIFICATION OF LAKE OR STREAMBED ALTERATION



Complete EACH field, unless otherwise indicated, following the enclosed instructions and submit ALL required enclosures. Attach additional pages, if necessary.

1. APPLICANT PROPOSING PROJECT

Name	James L. Croyle			
Business/Agency	Hydrogen Energy California, LLC			
Street Address	30 Monument Square, Suite 235			
City, State, Zip	Concord, MA, 01742			
Telephone	(978) 287-9529	Fax	(978) 287-9512	
Email	jcroyle@scsenergyllc.com			

2. CONTACT PERSON (Complete only if different from applicant)

Name	Dale Shileikis			
Street Address	One Montgomery Street, Suite 900			
City, State, Zip	San Francisco, CA, 94194			
Telephone	(415) 896-5858	Fax	(415) 882-9261	
Email	dale.shileikis@urs.com			

3. PROPERTY OWNER (Complete only if different from applicant)

Name	Hydrogen Energy International LLC, c/o BP Alternative Energy, ATTN: Dane Peacock			
Street Address	700 Louisiana Street, 32nd Floor			
City, State, Zip	Houston, TX 77002			
Telephone		Fax		
Email				

4. PROJECT NAME AND AGREEMENT TERM

A. Project Name		Hydrogen Energy California (HECA)		
B. Agreement Term Requested		<input checked="" type="checkbox"/> Regular (5 years or less) <input type="checkbox"/> Long-term (greater than 5 years)		
C. Project Term		D. Seasonal Work Period		E. Number of Work Days
Beginning (year)	Ending (year)	Start Date (month/day)	End Date (month/day)	
2014	2019			1,825.00

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

5. AGREEMENT TYPE

Check the applicable box. If box B, C, D, or E is checked, complete the specified attachment.		
A.	<input checked="" type="checkbox"/> Standard (Most construction projects, excluding the categories listed below)	
B.	<input type="checkbox"/> Gravel/Sand/Rock Extraction (Attachment A)	Mine I.D. Number: _____
C.	<input type="checkbox"/> Timber Harvesting (Attachment B)	THP Number: _____
D.	<input type="checkbox"/> Water Diversion/Extraction/Impoundment (Attachment C)	SWRCB Number: _____
E.	<input type="checkbox"/> Routine Maintenance (Attachment D)	
F.	<input type="checkbox"/> DFG Fisheries Restoration Grant Program (FRGP)	FRGP Contract Number: _____
G.	<input type="checkbox"/> Master	
H.	<input type="checkbox"/> Master Timber Harvesting	

6. FEES

Please see the current fee schedule to determine the appropriate notification fee. Itemize each project's estimated cost and corresponding fee. Note: The Department may not process this notification until the correct fee has been received.			
	A. Project	B. Project Cost	C. Project Fee
1	Hydrogen Energy California (HECA)	\$500,000.00	
2			
3			
4			
5			
		D. Base Fee (if applicable)	\$4,482.75
		E. TOTAL FEE ENCLOSED	\$4,482.75

7. PRIOR NOTIFICATION OR ORDER

A. Has a notification previously been submitted to, or a Lake or Streambed Alteration Agreement previously been issued by, the Department for the project described in this notification?	
<input type="checkbox"/> Yes (Provide the information below)	<input checked="" type="checkbox"/> No
Applicant: _____ Notification Number: _____ Date: _____	
B. Is this notification being submitted in response to an order, notice, or other directive ("order") by a court or administrative agency (including the Department)?	
<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (Enclose a copy of the order, notice, or other directive. If the directive is not in writing, identify the person who directed the applicant to submit this notification and the agency he or she represents, and describe the circumstances relating to the order.)	
<input type="checkbox"/> Continued on additional page(s)	

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

8. PROJECT LOCATION

A. Address or description of project location. <i>(Include a map that marks the location of the project with a reference to the nearest city or town, and provide driving directions from a major road or highway)</i>				
The Main Project Site will be located near the unincorporated community of Tupman in western Kern County, California at the address listed below: 7361 Adohr Road, Buttonwillow, CA 93206 Additionally, the Project would involve the construction of off-site linear utilities (identified in this Notification as Project linears). The locations of the Project linears and more details on the project location are described in Box 10 (Project Description) of this application and in the attached Supplemental Information.				
<input checked="" type="checkbox"/> Continued on additional page(s)				
B. River, stream, or lake affected by the project. See Supplemental Information.				
C. What water body is the river, stream, or lake tributary to? Tulare lake (KRFCC); Canals/Aqueducts are closed system				
D. Is the river or stream segment affected by the project listed in the state or federal Wild and Scenic Rivers Acts? <div style="display: flex; justify-content: space-between; align-items: center;"> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown </div>				
E. County Kern				
F. USGS 7.5 Minute Quad Map Name		G. Township	H. Range	I. Section
East Elk Hills (Main Project Site)		30 South	24 East	10
See Supplemental Information (Project Linears)				
<input checked="" type="checkbox"/> Continued on additional page(s)				
K. Meridian (check one) <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> Humboldt <input checked="" type="checkbox"/> Mt. Diablo <input type="checkbox"/> San Bernardino </div>				
L. Assessor's Parcel Number(s) See attached Supplemental Information (Section 1.8.1) for details.				
<input checked="" type="checkbox"/> Continued on additional page(s)				
M. Coordinates (If available, provide at least latitude/longitude or UTM coordinates and check appropriate boxes)				
Latitude/Longitude		Latitude: 35.332642		Longitude: -119.389247
		<input type="checkbox"/> Degrees/Minutes/Seconds <input checked="" type="checkbox"/> Decimal Degrees <input type="checkbox"/> Decimal Minutes		
UTM		Easting: 282842.2365 m	Northing: 3912552.2121 m	<input type="checkbox"/> Zone 10 <input checked="" type="checkbox"/> Zone 11
Datum used for Latitude/Longitude or UTM		<input type="checkbox"/> NAD 27 <input checked="" type="checkbox"/> NAD 83 or WGS 84		

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

9. PROJECT CATEGORY AND WORK TYPE (Check each box that applies)

PROJECT CATEGORY	NEW CONSTRUCTION	REPLACE EXISTING STRUCTURE	REPAIR/MAINTAIN EXISTING STRUCTURE
Bank stabilization – bioengineering/recontouring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bank stabilization – rip-rap/retaining wall/gabion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boat dock/pier	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boat ramp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bridge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Channel clearing/vegetation management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Culvert	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Debris basin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dam	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diversion structure – weir or pump intake	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Filling of wetland, river, stream, or lake	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Geotechnical survey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Habitat enhancement – revegetation/mitigation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Levee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low water crossing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Road/trail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sediment removal – pond, stream, or marina	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Storm drain outfall structure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Temporary stream crossing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Utility crossing : Horizontal Directional Drilling	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jack/bore	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Open trench	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

10. PROJECT DESCRIPTION

A. Describe the project in detail. Photographs of the project location and immediate surrounding area should be included.

- Include any structures (e.g., rip-rap, culverts, or channel clearing) that will be placed, built, or completed in or near the stream, river, or lake.
- Specify the type and volume of materials that will be used.
- If water will be diverted or drafted, specify the purpose or use.

Enclose diagrams, drawings, plans, and/or maps that provide all of the following: site specific construction details; the dimensions of each structure and/or extent of each activity in the bed, channel, bank or floodplain; an overview of the entire project area (i.e., "bird's-eye view") showing the location of each structure and/or activity, significant area features, and where the equipment/machinery will enter and exit the project area.

A brief overview of project activities and their anticipated impacts is presented below. For more detailed information, please see Box 10 of the Supplemental Information, as well as the Project Description (included as an appendix to the Supplemental Information).

The 453-acre HECA Project Site is the area where the Integrated Gasification Combined-Cycle polygeneration facility would be built. The HECA Project Site would be surrounded by the Controlled Area, which would remain as agriculture lands except for 91 acres adjacent to the Project Site that will be utilized for temporary staging and laydown during construction.

The HECA Project would also require the construction and installation of several offsite linear utility lines, or Project linears. The Project linears consist of a CO₂ pipeline, railroad spur, electrical transmission line, natural gas pipeline, and water supply pipelines. The construction of these features would require temporary and permanent impacts to irrigation canals that are addressed in this Notification. No aquatic features addressed in this Notification are located within the HECA Project Site.

Furthermore, the HECA Project involves an agreement to supply carbon dioxide (CO₂) to the adjacent Elk Hills Oil Field, which is owned and operated by Occidental of Elk Hills, Inc (OEHI). While the transport of CO₂ to OEHI is a separate project (hereafter referred to as the OEHI Project), this LSAA is being submitted to cover both the HECA Project and the OEHI Project.

☒ Continued on additional page(s)

B. Specify the equipment and machinery that will be used to complete the project.

Refer to the Box 10 project description in the attached supplemental information for the construction methods that will be used to complete the proposed project.

☒ Continued on additional page(s)

C. Will water be present during the proposed work period (specified in box 4.D) in the stream, river, or lake (specified in box 8.B).

☒ Yes ☐ No (Skip to box 11)

D. Will the proposed project require work in the wetted portion of the channel?

☐ Yes (Enclose a plan to divert water around work site)
☒ No

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

11. PROJECT IMPACTS

A. Describe impacts to the bed, channel, and bank of the river, stream, or lake, and the associated riparian habitat. Specify the dimensions of the modifications in length (linear feet) and area (square feet or acres) and the type and volume of material (cubic yards) that will be moved, displaced, or otherwise disturbed, if applicable.

The installation of off-site utility lines would affect irrigation canals, as described in the Supplemental Information for Box 11. These impacts would be temporary and would result from activities during pipeline or rail spur construction that include ground excavation, trenching, grading, and the backfill of excavated areas. See attached Supplemental Information for more details.

☒ Continued on additional page(s)

B. Will the project affect any vegetation?

☒ Yes (Complete the tables below) ☐ No

Vegetation Type	Temporary Impact	Permanent Impact
See attached supplemental information	Linear feet: _____ Total area: _____	Linear feet: _____ Total area: _____
	Linear feet: _____ Total area: _____	Linear feet: _____ Total area: _____

Tree Species	Number of Trees to be Removed	Trunk Diameter (range)
No trees will be removed as part of the project.	0	

☐ Continued on additional page(s)

C. Are any special status animal or plant species, or habitat that could support such species, known to be present on or near the project site?

☒ Yes (List each species and/or describe the habitat below) ☐ No ☐ Unknown

Blunt-nosed leopard lizard, giant kangaroo rat, Tipton kangaroo rat, San Joaquin kit fox, Buena Vista Lake Shrew

☐ Continued on additional page(s)

D. Identify the source(s) of information that supports a "yes" or "no" answer above in Box 11.C.

Draft Biological Assessment (attached).

☒ Continued on additional page(s)

E. Has a biological study been completed for the project site?

☒ Yes (Enclose the biological study) ☐ No

Note: A biological assessment or study may be required to evaluate potential project impacts on biological resources.

F. Has a hydrological study been completed for the project or project site?

☐ Yes (Enclose the hydrological study) ☒ No

Note: A hydrological study or other information on site hydraulics (e.g., flows, channel characteristics, and/or flood recurrence intervals) may be required to evaluate potential project impacts on hydrology.

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

12. MEASURES TO PROTECT FISH, WILDLIFE, AND PLANT RESOURCES

A. Describe the techniques that will be used to prevent sediment from entering watercourses during and after construction.

Best Management Practices (BMPs) would be implemented during construction activities. A Storm Water Pollution Prevention Plan (SWPPP) would be developed and implemented. A frac-out response plan would be developed for HDD activities. Temporary disturbance areas, would be restored to their pre-project condition following construction.

See Supplemental Information for details.

☒ Continued on additional page(s)

B. Describe project avoidance and/or minimization measures to protect fish, wildlife, and plant resources.

See the Supplemental Information for Box 12 for description of the proposed avoidance and minimization measures. Also see Special Status Plant and Wildlife Avoidance and Minimization Measures, Sections 2.3.4 and 2.3.5 in the Biological Assessment (attached).

☒ Continued on additional page(s)

C. Describe any project mitigation and/or compensation measures to protect fish, wildlife, and plant resources.

See the Supplemental Text for Box 12 for a summary of project avoidance and minimization measures to protect fish, wildlife and plant resources. Additional details are provided in the description of the Special Status Plant and Wildlife Avoidance and Minimization Measures, Sections 2.3.4 and 2.3.5 in the Biological Assessment (attached).

☒ Continued on additional page(s)

13. PERMITS

List any local, state, and federal permits required for the project and check the corresponding box(es). Enclose a copy of each permit that has been issued.

- | | | |
|--|---|---------------------------------|
| A. <u>Section 404 CWA (Dredge and Fill)</u> | <input checked="" type="checkbox"/> Applied | <input type="checkbox"/> Issued |
| B. <u>Section 401 CWA (Water Quality Certification)</u> | <input checked="" type="checkbox"/> Applied | <input type="checkbox"/> Issued |
| C. <u>Section 7 ESA (Biological Assessment)</u> | <input checked="" type="checkbox"/> Applied | <input type="checkbox"/> Issued |
| D. Unknown whether <input type="checkbox"/> local, <input type="checkbox"/> state, or <input type="checkbox"/> federal permit is needed for the project. (Check each box that applies) | | |

☒ Continued on additional page(s)

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

14. ENVIRONMENTAL REVIEW

<p>A. Has a draft or final document been prepared for the project pursuant to the California Environmental Quality Act (CEQA), National Environmental Protection Act (NEPA), California Endangered Species Act (CESA) and/or federal Endangered Species Act (ESA)?</p> <p><input type="checkbox"/> Yes (Check the box for each CEQA, NEPA, CESA, and ESA document that has been prepared and enclose a copy of each)</p> <p><input checked="" type="checkbox"/> No (Check the box for each CEQA, NEPA, CESA, and ESA document listed below that will be or is being prepared)</p>			
<input type="checkbox"/> Notice of Exemption <input type="checkbox"/> Initial Study <input type="checkbox"/> Negative Declaration <input type="checkbox"/> THP/ NTMP	<input type="checkbox"/> Mitigated Negative Declaration <input type="checkbox"/> Environmental Impact Report <input type="checkbox"/> Notice of Determination (Enclose) <input type="checkbox"/> Mitigation, Monitoring, Reporting Plan	<input checked="" type="checkbox"/> NEPA document (type): <u>DOE EIS</u> <input checked="" type="checkbox"/> CESA document (type): <u>CEC FSA/EIR</u> <input checked="" type="checkbox"/> ESA document (type): <u>BA</u>	
<p>B. State Clearinghouse Number (if applicable)</p>			
<p>C. Has a CEQA lead agency been determined?</p>		<input checked="" type="checkbox"/> Yes (Complete boxes D, E, and F) <input type="checkbox"/> No (Skip to box 14.G)	
<p>D. CEQA Lead Agency</p>	<p style="text-align: center;">California Energy Commission</p>		
<p>E. Contact Person</p>	<p style="text-align: center;">Bob Worl</p>	<p>F. Telephone Number</p>	<p style="text-align: center;">(916) 651-8853</p>
<p>G. If the project described in this notification is part of a larger project or plan, briefly describe that larger project or plan.</p> <p>The HECA Project described in this Notification is the entire project, including actions that are proposed as part of the OEHI Project for CO2 EOR.</p> <p style="text-align: right;"><input type="checkbox"/> Continued on additional page(s)</p>			
<p>H. Has an environmental filing fee (Fish and Game Code section 711.4) been paid?</p> <p><input type="checkbox"/> Yes (Enclose proof of payment) <input checked="" type="checkbox"/> No (Briefly explain below the reason a filing fee has not been paid)</p> <p>Filing fee will be provided to the California Energy Commission following the Commission's decision on the Project's Application for Certification.</p> <p><i>Note: If a filing fee is required, the Department may not finalize a Lake or Streambed Alteration Agreement until the filing fee is paid.</i></p>			

15. SITE INSPECTION

<p>Check one box only.</p>	
<p><input type="checkbox"/> In the event the Department determines that a site inspection is necessary, I hereby authorize a Department representative to enter the property where the project described in this notification will take place at any reasonable time, and hereby certify that I am authorized to grant the Department such entry.</p>	
<p><input checked="" type="checkbox"/> I request the Department to first contact (insert name) <u>Marisa Mascaro</u> at (insert telephone number) <u>(978) 287-9529</u> to schedule a date and time to enter the property where the project described in this notification will take place. I understand that this may delay the Department's determination as to whether a Lake or Streambed Alteration Agreement is required and/or the Department's issuance of a draft agreement pursuant to this notification.</p>	

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

16. DIGITAL FORMAT

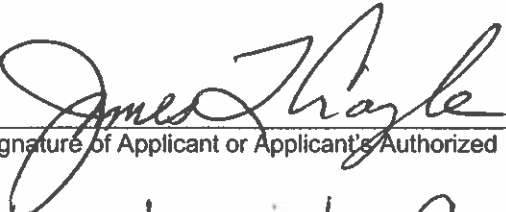
Is any of the information included as part of the notification available in digital format (i.e., CD, DVD, etc.)?

☒ Yes (Please enclose the information via digital media with the completed notification form)

☐ No

17. SIGNATURE

I hereby certify that to the best of my knowledge the information in this notification is true and correct and that I am authorized to sign this notification as, or on behalf of, the applicant. I understand that if any information in this notification is found to be untrue or incorrect, the Department may suspend processing this notification or suspend or revoke any draft or final Lake or Streambed Alteration Agreement issued pursuant to this notification. I understand also that if any information in this notification is found to be untrue or incorrect and the project described in this notification has already begun, I and/or the applicant may be subject to civil or criminal prosecution. I understand that this notification applies only to the project(s) described herein and that I and/or the applicant may be subject to civil or criminal prosecution for undertaking any project not described herein unless the Department has been separately notified of that project in accordance with Fish and Game Code section 1602 or 1611.


Signature of Applicant or Applicant's Authorized Representative

4/30/13
Date

James L. Croyle
Print Name

HYDROGEN ENERGY CALIFORNIA KERN COUNTY, CALIFORNIA

SECTION 1602 LAKE AND STREAMBED ALTERATION AGREEMENT SUPPLEMENTAL INFORMATION

Prepared for:

Hydrogen Energy California, LLC

30 Monument Square, Suite 235

Concord, MA 01742

Contact: Marisa Mascaro

(978) 287-9529

Prepared by:

URS Corporation

Post Montgomery Center

One Montgomery Street, Suite 900

San Francisco, CA 94104-4538

Contact: Dale Shileikis

(415) 896-5858

URS Project Number 28068052

April 2013

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Appendices

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Appendix C	Preliminary Jurisdictional Delineation (provided separately)
Appendix D	Horizontal Directional Drilling Plan
Appendix E	Biological Assessment (provided separately)

Acronyms

APN	Assessor Parcel Number
BA	Biological Assessment
BMP	best management practice
BRMIMP	Biological Resources Mitigation Implementation and Monitoring Plan
BVWSD	Buena Vista Water Storage District
CO ₂	carbon dioxide
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
DOE	U.S. Department of Energy
EOR	enhanced oil recovery
ESA	Endangered Species Act
HECA	Hydrogen Energy California
HDD	horizontal directional drilling
HDDP	Horizontal Directional Drilling Plan
IGCC	Integrated Gasification Combined Cycle
ITP	Incidental Take Permit
KRFCC	Kern River Flood Control Channel
OEHI	Occidental of Elk Hills, Inc.
PG&E	Pacific Gas and Electric
ROW	right-of-way
SJVRR	San Joaquin Valley Railroad
USFWS	U.S. Fish and Wildlife Service
WKWD	West Kern Water District
WS	Waters of the State
WUS	Water of the United States

INTRODUCTION

The following sections contain supplemental information for the Hydrogen Energy California (HECA) Project Section 1602 Lake and Streambed Alteration Agreement submitted to the California Department of Fish and Wildlife (CDFW [formerly California Department of Fish and Game]). Information is organized by box and corresponding subject based on the Notification of Lake or Streambed Alteration form.

A complete and detailed project description is provided as an appendix (Appendix A). The information presented in this supplemental text addresses each question fully and completely, but only presents the project information that is relevant to the activities that would occur in waters subject to the jurisdiction of CDFW.

Hydrogen Energy California LLC (HECA LLC) is proposing to build an Integrated Gasification Combined Cycle (IGCC) polygeneration project (HECA or the Project) in Kern County, California (Figure 1). HECA LLC is owned by SCS Energy California LLC. The Project will gasify a 75 percent coal and 25 percent petroleum coke (petcoke) fuel blend to produce synthesis gas (syngas). Syngas produced via gasification will be purified to hydrogen-rich fuel, which will be used to generate low-carbon baseload electricity in a Combined-Cycle Power Block, low-carbon nitrogen-based products in an integrated Manufacturing Complex, and carbon dioxide (CO₂) for use in enhanced oil recovery (EOR).

The Project will gasify blends of petroleum coke and coal, as needed, to produce hydrogen to fuel a combustion turbine operating in combined-cycle mode. The Gasification Block feeds a 390-gross-megawatt combined-cycle plant. The net electrical generation output from the Project will provide California with approximately 300-megawatt output of low-carbon baseload electrical power to the grid. The Project will use the hydrogen produced in the gasifier to produce low-carbon nitrogen-based products in an integrated Manufacturing Complex.

The fertilizers and power produced by the HECA Project will have a low-carbon footprint, because more than 90 percent of the CO₂ in the syngas will be captured and approximately 3 million tons per year of CO₂ will be transported via pipeline for use in EOR, which results in simultaneous sequestration (storage) of the CO₂ in a secure geologic formation (HECA, 2012). CO₂ will be transported (via an approximately 3.4-mile-long pipeline) for use in EOR in the adjacent Elk Hills Oil Field (EHOF), which is owned and operated by Occidental of Elk Hills, Inc. (OEHI) (hereafter referred to as the OEHI Project).

The U.S. Department of Energy (DOE) is providing financial assistance to the HECA Project under the Clean Coal Power Initiative Round 3 via a cost-sharing agreement with HECA LLC.

The following terms are used throughout the application and are defined below.

- HECA Project (or “Project”) – Referring to the Hydrogen Energy California Project as a whole.
- HECA Project Site (or “Project Site”) – The 453-acre site where the power generating facility and associated structures would be constructed.

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- OEHI Project – The transport of CO₂ from the HECA Project Site to OEHI for simultaneous EOR and carbon sequestration.
- Controlled Areas –HECA has an agreement to purchase an additional 653 acres that are immediately adjacent to the HECA Project Site. With the exception of temporary construction impacts for linear facilities and construction laydown, current plans are to continue to use the Controlled Area for agricultural purposes during construction and operations.
- Project Linears – Any or all of the linear utility components (such as rail lines or pipelines) that would be built offsite (i.e., not on the Project Site) as part of the Project.

BOX 8 – PROJECT LOCATION

A brief description of the project components and their location is provided below. For more information, see the attached Project Description (Appendix A).

Project Site

The Project Site consists of approximately 453 acres in Kern County, California, as shown on Figure 1. The Project Site is approximately 2 miles northwest of the unincorporated community of Tupman. The street address of the Project Site is 7361 Adohr Road, Buttonwillow, California, 93206. The Project Site is in the East Elk Hills USGS 7.5-minute quadrangle, Section 10 of Township 30 South, Range 24 East in Kern County. The Project Site Assessor's Parcel Numbers (APNs) are as follows:

- Part of 159-040-02
- Part of 159-040-16
- Part of 159-040-18

The 653-acre Controlled Area is shown on Figure 2. The APNs associated with the Controlled Area are as follows:

- All of 159-040-04
- All of 159-040-11
- All of 159-040-17
- All of 159-190-09
- Remnant part of 159-040-02
- Remnant part of 159-040-16
- Remnant part of 159-040-18

The Project Site is predominantly used for agricultural purposes, including cultivation of cotton, alfalfa, and onions. Land use in the vicinity of the Project Site is primarily agricultural. Adjacent land uses include Adohr Road and agricultural uses to the north; Tupman Road and agricultural uses to the east; agricultural uses and an irrigation canal to the south; and Dairy Road right of way and agricultural uses to the west. The West Side Canal (and the Outlet Canal, Kern

River Flood Control Channel (KRFCC), and the California Aqueduct (State Water Project) are approximately 500, 700, and 1,900 feet south of the Project Site, respectively.

Project Linears

In addition to the Project Site, the Project requires the construction and installation of several offsite linear components (Figure 3). The utility lines and linear facilities associated with the proposed Project include the following:

- **Electrical transmission line.** An approximately 2-mile electrical transmission line will be constructed between the Project Site and a future Pacific Gas and Electric (PG&E) switching station located east of the Project Site.
- **Natural gas supply pipeline.** An approximately 13-mile natural gas pipeline will connect the Project Site to an existing PG&E natural gas pipeline located to the north.
- **Water supply pipelines.** The Project will use brackish groundwater for process water, supplied from Buena Vista Water Storage District (BVWSD) wells that will be located to the northwest of the Project Site. The raw water supply pipeline will be approximately 15 miles in length, and connect to five new groundwater wells. Potable water for drinking and sanitary use will be supplied by West Kern Water District (WKWD) to the east. The potable water supply pipeline will be approximately 1 mile in length, and parallel the electrical transmission line route.
- **Carbon dioxide pipeline.** An approximately 3-mile CO₂ pipeline will transfer the CO₂ captured from the Project Site south to the OEHI CO₂ processing facility.
- **Industrial railroad spur.** A new, approximately 5-mile railroad spur would be constructed to connect the Project Site to the existing San Joaquin Valley Railroad (SJVRR) Buttonwillow railroad line, north of the Project Site. The railroad spur would deliver coal to the project site, as well as export products during operations. If available, the railroad spur will also be used to deliver plant equipment during construction. Public and private at-grade crossings would also be constructed.

The Project linears begin at the Project Site and are aligned generally along existing rights-of-way (ROWs) such as roads, railroads, or canals until their termini at various locations up to 15 miles from the project site. The Project linears are located within the Tupman, East Elk Hills, West Elk Hills, Lokern, Buttonwillow, and Rio Bravo USGS quads. A list containing parcel and landowner information for all properties adjacent to or within the (ROW) of these features is provided in Appendix B.

Directions to Project Site

The following directions are for travel from downtown Sacramento, California to the Project Site:

- Head south on Interstate 5 (Approximately 265 miles)

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- Take Exit 253 for Stockdale Highway/Bellevue Road (0.3 mile)
- Turn right to continue west on Stockdale Highway/Bellevue Road (3.2 miles)
- Turn left to head south on Dairy Road (1.0 mile)
- The project site is located at the intersection of Dairy Road and Adohr Road.

The Project Site is bordered by Adohr Road to the north and Tupman Road to the east.

The routes of the Project linears are not all accessible by road, depending on segment. An overview of the proposed routes of each of the Project linears is presented on Figure 3.

BOX 10 – PROJECT DESCRIPTION

Construction of the Project Site facilities would not impact aquatic or upland habitats regulated under Section 1600 of the California Fish and Game Code. However, some of the Project linears could potentially affect water features, as described under Project Impacts (Box 11), below. A brief description of the Project Site is included below for reference, in addition to descriptions of the proposed linear facilities. See the attached Project Description (Appendix A) for more information.

Project Components

Project Site

The proposed Integrated Gasification Combined-Cycle (IGCC) polygeneration project would be built on the 453-acre Project Site.

Construction of the IGCC within the Project Site will occur during a 48-month construction period. All construction laydown and parking areas will be within the HECA Project Site and a 91-acre construction staging area in the adjacent Controlled Area. Onsite construction activities would include clearing and grubbing, grading, hauling, layout of equipment, delivery and handling of materials and supplies, and HECA Project construction and testing operations. The HECA Project Site occurs in an area of relatively flat topography. Site grading will occur as necessary to form level building pads for major process units.

Construction site access will be via Dairy Road for truck deliveries and Adohr Road for construction craft vehicles arriving and departing the site. Initial site preparation will include construction of temporary access roads, parking, laydown areas, office and warehouse facilities, installation of erosion control measures, and other improvements necessary for construction. Erosion control measures will include construction of stormwater retention basins and related site drainage facilities to control runoff within the Project Site boundary. Existing drainage patterns outside the Project Site boundary will remain unchanged, and no runoff from outside the Project Site boundary will flow onto the Project Site.

Natural Gas Supply Line

A new natural gas pipeline will interconnect with the existing PG&E natural gas pipeline located north of the Project Site. The interconnect will consist of one tap off the existing natural gas line

and one metering station at the beginning of the natural gas pipeline adjacent to the PG&E Inlet. The metering station will be up to 100 feet by 100 feet, surrounded by a chain link fence. In addition, there will be a metering station at the end of the natural gas pipeline, on the southwestern side of the Project Site, and a pressure-limiting station on the Project Site. HECA or PG&E will construct the natural gas pipeline. PG&E will own the natural gas pipeline. The natural gas line is approximately 13 miles in length, including 5.28 miles that would be located within the railroad spur line ROW.

Construction of the natural gas pipeline interconnection will include the following standard pipeline construction activities: clearing and grubbing, hauling and stringing of the pipe along the route; welding, radiographic inspection, and coating of the pipe welds; trenching; lowering of the pipe into the trench; backfill of the trench; hydrostatic testing of the pipeline; tie-in to the existing pipeline; purging the pipeline; and cleanup and restoration of construction areas. The hydrotest water will be sampled, tested, and disposed of in compliance with National Pollutant Discharge Elimination System permit(s). Roads and ROW will be restored to specifications of the Project and affected agencies.

Construction of the natural gas pipeline interconnection will take approximately 6 months. It is scheduled to be finished and operational in time to provide test gas to the Project. Construction will occur in accordance with a traffic management plan to minimize impacts to traffic. Grade cuts will be restored to their original contours, and affected areas will be restored to their original condition to minimize erosion. No new access roads would be constructed for maintenance and operation of the natural gas pipeline because existing access roads are adequate for this purpose.

PG&E will own, operate, and maintain the natural gas pipeline. Maintenance of the natural gas pipeline would follow PG&E corporate policies and protocols. Long-term maintenance needs of the natural gas pipeline would be minimal during the 25-year lifespan of the Project.

Water Supply Lines

For process water, the Project will use brackish groundwater supplied from the BVWSD. BVWSD will construct and own the process water pipeline. The process water pipeline route runs from Seventh Standard Road to the Project Site, along the existing BVWSD road on the northeastern side of the West Side Canal. The 30-inch-diameter process water supply pipeline will be approximately 15 miles in length. The construction ROW will be approximately 50 feet wide, and the permanent ROW for maintenance and operation of the pipeline will be approximately 25 feet wide.

BVWSD will construct and own a well field for the Project process water supply that will be located in the western portion of BVWSD's service area near the West Side Canal in the vicinity of Seventh Standard Road, at the northern end of the 15-mile-long process water line. It is currently anticipated that there will be up to five groundwater extraction wells. Two of these wells will provide operational redundancy. The maximum depth of the wells will be approximately 300 feet below ground surface. The brackish water will be treated on the Project Site to meet all process and utility water requirements.

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For drinking and sanitary use, the Project will use potable water supplied by WKWD. The potable water line will be constructed and owned by HECA LLC. The potable water supply pipeline route runs approximately 1 mile east from the northeastern corner of the Project Site. This pipeline will be placed within the electrical transmission corridor ROW, and would not require additional easements.

Installation of the water supply pipelines will include standard construction activities for pipelines, including clearing and grubbing; trenching; hauling and stringing of pipe along the route; welding; radiographic inspection and coating of pipe welds; lowering welded pipe into the trench; hydrostatic testing; and backfilling and restoring the approximate surface grade. Construction of the process water pipeline is expected to take approximately 6 months to complete. The source of the water to be used for hydrostatic testing of the pipelines will be an on-site irrigation well, supplemented by potable water from WKWD. The hydrotest water will be sampled, tested, and disposed of in compliance with National Pollutant Discharge Elimination System permit(s). Clean water with suitable chemistry will be routed to the stormwater retention basin. Water that is not suitable for routing to the retention basin will be transported by truck to an appropriately licensed off-site treatment or disposal facility.

BVWSD will own, operate, and maintain the approximately 15-mile process water pipeline and associated wells. Annual maintenance of the process water pipeline and associated groundwater wells would be conducted by BVWSD. Maintenance activities of the wells and the pipeline would follow BVWSD corporate policies and protocols.

Long-term maintenance needs of the process water pipeline would be minimal during the 25-year lifespan of the Project. HECA will own, operate, and maintain the approximately 1-mile potable water pipeline. Maintenance activities of the pipeline would include:

- Annual reconnaissance of the pipeline ROW
- Annual inspection and exercising (opening and closing for one cycle) of valves, as necessary
- Annual vegetation removal, re-grading, and application of dirt for the access road after wet periods and pipe work, as necessary
- As determined necessary by routine inspection, replacement of pipeline components (lining and coating, valves, and joints)

Long-term maintenance needs of the potable water pipeline would be minimal during the 25-year lifespan of the Project; therefore, they are not quantified in this document.

Carbon Dioxide Pipeline

A 12-inch-diameter CO₂ pipeline will be constructed to transfer the CO₂ produced by the HECA Project to the OEHI CO₂ Processing Facility used by OEHI for injection into deep underground hydrocarbon reservoirs for CO₂ EOR. The CO₂ pipeline route will leave the southwestern portion of the HECA Project Site and will use horizontal directional drilling (HDD) to pass

under the West Side Canal, Outlet Canal, the KRFCC, and the California Aqueduct. The number of HDD entry and exit pits will be determined based on field conditions. HDD would also be used to avoid disturbance of archaeological sites. On the southern side of the aqueduct, the route extends southeast and south to the OEHI CO₂ Processing Facility and parallels existing private roads. The construction ROW would be 80 feet wide along the linear length plus the two 120-foot by 100-foot entry pits, and two 75-foot by 100-foot exit pits needed for HDD. The permanent ROW would be 25 feet wide. OEHI will construct and own the CO₂ pipeline.

With the exception of the proposed HDD crossings, where the depth of the CO₂ pipeline would be approximately 50 to 100 feet below grade, the pipeline will be buried approximately 5 feet below grade, and will be protected by cathodic protection and monitored by independent leak-detection systems. Construction of the CO₂ pipeline interconnection will include standard pipeline construction activities: clearing and grubbing; trenching; hauling and stringing of the pipe along the route; welding; radiographic inspection; coating of the pipe welds; lowering of the pipe into the trench; backfill of the trench; hydrostatic testing of the pipeline; purging the pipeline; and cleanup and restoration of construction areas. The hydrostatic test water will be sampled, tested, and disposed of in compliance with National Pollutant Discharge Elimination System permit(s). Grade cuts will be restored to their original contours, and affected areas will be restored to their original state to minimize erosion. Construction of the CO₂ pipeline will take approximately 6 months.

OEHI will own, operate, and maintain the CO₂ pipeline. Maintenance of the CO₂ linear will follow OEHI corporate policies and protocols. Long-term maintenance needs of the CO₂ pipeline would be minimal during the 25-year lifespan of the Project.

Horizontal Directional Drilling

HDD will be used to install the CO₂ pipeline under the West Side Canal, the Outlet Canal, the KRFCC, and the California Aqueduct. The depth of HDD under these water bodies will comply with all applicable federal and state regulations.

The California Department of Water Resources, Encroachment Permit Guidelines—June 2005, identifies specific requirements regarding the use of HDD for the crossing of the California Aqueduct. The principal requirements include, but are not limited to, the following:

- A site-specific geotechnical report must be submitted to the California Department of Water Resources with the Encroachment Permit application.
- Pipe sleeves are required with any pipeline carrying hazardous materials or pollutants.
- The minimum separation between the bottom of the aqueduct channel and the top of pipe is 25 feet; further separation may be required depending on the actual pipe diameter.
- Drawings submitted with the Encroachment Permit Application must include the following information for buried pipelines (at a minimum):

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- Aqueduct mileposts at each crossing, pipe size, location, and type of material transported
- Maximum operating pressure, type of pipe and pipe joints, pipe wall thickness, maximum test pressure, and description of test procedures
- Type of sleeve/casing, including diameter, joints, and wall thickness
- Protection coatings and a description of control measures
- Method employed to accommodate pipeline expansion and contraction
- Thrust block location and details
- Pipeline coatings and corrosion control measures
- Location of shutoff valves on each side of the crossing
- List of applicable design codes
- Location, including depth of the buried aqueduct communication and control cables
- Identification of existing utility easements or encroachments in the immediate vicinity of the proposed crossing

The HDD method includes a drilling rig that will bore a horizontal hole under the water crossings. At each of these crossings, laydown areas (or entry/exit pits) have been identified on either side of the water course to accommodate the HDD installation. Best management practices for HDD are described in the response to Box 12 below.

Railroad Industrial Spur

The industrial railroad spur would require a 75-foot construction ROW, a 60-foot permanent ROW, and a 3-acre rail laydown area. Construction of the railroad spur will occur early in the project construction timeline so that the railroad spur could be used to deliver additional equipment. Construction of the railroad spur is expected to span approximately 5 months. Construction of the railroad spur will use earthwork and track construction equipment typically used on similar rail projects throughout California and the United States. The following is a summary of the construction sequence and methods anticipated to be used for the railroad spur.

Because the majority of the alignment is traversing previously disturbed agricultural areas, minimal clearing and grubbing of the proposed ROW will be required to remove vegetation. Once the ROW is cleared, rough grading work will begin. Earth-moving equipment will create a track embankment section and drainage ditches using standard equipment consisting of bulldozers, scrapers, dump trucks, roadway graders, and vibratory compactors. Utility relocation work will also be performed as part of this initial grading work. Existing local service power lines and underground irrigation piping will be relocated or protected in place. The natural gas linear will follow the railroad spur linear from the Project Site to its interconnection with the existing SJVRR line. The natural gas linear will be installed 25 feet from the centerline of the track.

A laydown area for track construction materials will be located near the proposed interconnection to the existing SJVRR track, totaling approximately 3 acres of temporary disturbance. Along the new rail spur, truck turnaround points will be required about every 0.25 mile. These truck turnaround points will be typical hammerhead design of about 30 feet by 75 feet. All work will be performed within the proposed 75-foot railway construction ROW.

HECA anticipates that it will own, operate, and maintain the approximately 5-mile railroad spur. Regardless of final ownership of the spur, maintenance activities will consist of routine annual maintenance activities, and programmed maintenance conducted on a periodic basis. Annual maintenance activities consist of visual inspections, vegetation control, spot surfacing and lining of rough spots in the track, and adjusting/lubrication of turnouts. In addition, any warning devices at road crossings will be inspected as frequently as monthly.

Programmed major maintenance consists of surfacing and lining the rail line, typically every 3 to 5 years; and replacing the rail, potentially once during the life of the plant. If timber ties are used rather than concrete ties, 15 percent of the timber ties would need to be replaced on a 10-year cycle. Major maintenance activities will be conducted using on-track equipment. Replaced materials will be removed from the ROW and recycled. Timber ties will be disposed of by incineration, landfill disposal, or other approved disposal options.

Project Schedule

Details of the project schedule are still under development; however, project construction activities are anticipated to start as early as late-2013, with completion of project activities to occur roughly 48 months later.

Completion of California Energy Commission (CEC) permitting process ...late 2013
Commencement of pre-construction and construction activities.....late 2013
Commencement of commercial operation of the Project2017

Construction Equipment and Machinery

Within the Project Site, construction equipment and machinery would include a variety of cranes, tractors, and trucks. Equipment estimates are provided in Appendix A, Project Description.

Construction of the Project linears would include the use of clearing and grubbing equipment to prepare the site, excavators for ditching, and pipe layers, cranes, and heavy trucks for pipe installation

HDD would involve the use of standard HDD equipment and machinery, including drilling rig, mud system, mud rotors, downhole tools, guidance system, and rig safety systems.

BOX 11 – PROJECT IMPACTS

Affected Water Bodies

Based on direction from CDFW and the CEC, only major channels, canals, and aqueducts are considered jurisdictional waters for evaluation in this Notification. These features are presented on Figure 4. Other water features in the study area, including engineered agricultural irrigation ditches and isolated detention basins, are not considered jurisdictional and are not addressed in this Notification. A Preliminary Jurisdictional Delineation of wetlands and other waters of the United States has been prepared and submitted to the U.S. Army Corps of Engineers.

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Table 1 presents the aquatic features potentially regulated under Section 1600 of the California Fish and Game Code that would be affected by the project.

Table 1
Affected Water Bodies

Feature	Name (if applicable)	Jurisdiction	Temporary		Permanent	
			Impact Area (acre)	Impact Length (feet)	Impact Area (acre)	Impact Length (feet)
WS 8	Eightyfoot Ditch	State	0.02	25	--	--
WS 25	Outlet Canal	State	--*	--*	--	--
WS 28	West Side Canal	State	--*	--*	--	--
WS 43	East Side Canal	State	0.02	25	--	--
WS 54	East Side Canal	State	0.04	53	0.14	210
WUS 53	California Aqueduct	Federal	--*	--*	--	--
WUS 54	Kern River Flood Control Channel	Federal	--*	--*	--	--
Total			0.08	103	0.14	210
*Crossings of these features would be constructed using horizontal directional drilling; therefore, no impacts are anticipated. WS = Waters of the State WUS = Waters of the United States						

Impacts Discussion

WS 8 (Eightyfoot Ditch)

The process water pipeline will cross WS 8, a large irrigation ditch (also known as the Eightyfoot Ditch), along its route parallel to the West Side Canal.

Although details on the methods of pipeline crossing installation are not yet known, the pipeline crossing would not affect the available functions and services of the ditch. To avoid impacts to sensitive features, pipeline installation methods such as jack-and-bore, pipe ramming, auger boring, or microtunnelling may be used. These construction methods would allow the pipeline to be constructed beneath the ditch without causing surface disturbance or interrupting irrigation operations. Entrance and exit pits required for these methods would be located and excavated at least 10 feet away from the ditch.

If the avoidance methods described above are infeasible, the pipeline crossing of the ditch will be constructed when the ditch is dry, using open-cut techniques. Alternatively, construction methods for in-water work could include conventional open cut, with installation of a flume, or coffer dams using pumping to maintain irrigation water flow during construction. Regardless of the construction method employed, impacts are expected to be temporary, and not exceed the impacted areas detailed in Table 1.

WS 43, 54 (East Side Canal)

The potable water pipeline, the natural gas pipeline, and the railroad spur will cross the East Side Canal, which will result in both temporary and permanent impacts. The East Side Canal is an engineered irrigation canal used for agricultural purposes.

Although details on the methods of pipeline crossing installation are not yet known, the pipeline crossing would not affect the available functions and services of the canal. To avoid impacts to sensitive features, pipeline installation methods such as jack-and-bore, pipe ramming, auger boring, or microtunnelling may be used. These construction methods would allow the pipeline to be constructed beneath the canal without causing surface disturbance or interrupting irrigation operations. Entrance and exit pits required for these methods would be located and excavated at least 10 feet away from the canal.

If the avoidance methods described above are infeasible, the pipeline crossing of the canal will be constructed when the ditch is dry, using open-cut techniques. Alternatively, construction methods for in-water work could include conventional open cut, with installation of a flume, or coffer dams using pumping to maintain irrigation water flow during construction. Regardless of the construction method employed, impacts are expected to be temporary, and not exceed the impacted areas detailed in Table 1.

The construction of the railroad spur would require a bridge crossing over the East Side Canal. Construction of a bridge would require the installation of permanent concrete or steel abutments and support structures. Although the installation of the railroad bridge would result in permanent fill in the bed and banks of the canal, the canal is an engineered irrigation conveyance facility that is intensively managed, and has limited biological functions and services. The available functions and services would not be substantially degraded by the proposed structures within the East Side Canal. The final design of the crossing has not been established, but may include support piles within the canal. The area affected by the pile supports has been conservatively estimated using the entire width of the permanent railroad ROW (60 feet), and a length (parallel to the railroad centerline) equal to the entire length of the crossing (0.14 acre). The actual footprint of the proposed bridge is likely to be less, but the final design of the crossing has not been completed. Aside from the site of the railroad bridge, all of the potential impacts to the East Side Canal would be temporary, and the bed and banks would be restored following construction.

The bridge across the East Side Canal would be constructed when the canal is dry to minimize or avoid potential impacts to water conveyance or water quality.

WS 28 (West Side Canal); WS 25, WUS 53, WUS 54 (Outlet Canal, California Aqueduct, Kern River Flood Control Channel)

The CO₂ pipeline would be installed beneath features WS 28, WS 25, WUS 53, and WUS 54 (the West Side Canal, the Outlet Canal, the California Aqueduct, and the KRFCC, respectively). Impacts to these features would be avoided by using HDD to construct the pipeline. Two HDD operations would be needed for the pipeline installation: one at the crossing of the West Side Canal, and the other at the crossing of the Outlet Canal, California Aqueduct, and KRFCC. The

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West Side Canal crossing would be approximately 500 feet in length, and the Outlet Canal/California Aqueduct/KRFCC crossing would be approximately 2,000 feet in length. At both crossings, the pipeline would be installed at a depth of up to 50 to 100 feet below grade to avoid impacts to the bed or banks of these features.

A Horizontal Directional Drilling Plan (HDDP) would be submitted to CDFW before any HDD activities occur. The HDDP includes a frac-out (unexpected discharges of hydraulic drilling fluid) spill response plan. In the case of a frac-out, any hydraulic fluid that reaches the surface would be contained and removed, resulting only in temporary disturbance. The draft HDDP is attached in Appendix D; the final HDDP will be prepared during final design. Prior to installation of the pipeline using HDD, a small gauge wire line may need to be installed across the ground surface of the channel to measure progress of the drilling process. This wire line would not have any temporary or permanent impacts to vegetation or aquatic habitats.

Vegetation Impacts

No vegetation impacts would occur as part of the proposed canal crossings. The impacted water crossings evaluated in this application are generally unvegetated, or support minimal ruderal vegetation. Other components of the proposed project will involve vegetation impacts, but they are not related to or located in any water features.

Table 2 presents the acres of impact to vegetation communities for each project component. The Natural/Ruderal habitat within the project area is mostly comprised of allscale scrub vegetation. No trees will be removed as part of the project.

Wildlife Impacts

A number of State and Federally Threatened/Endangered Species potentially occur in the Project Area (see Table 3). A Biological Assessment (BA) has been submitted to the U.S. Fish and Wildlife Service (USFWS) that addresses potential impacts to species listed under the federal Endangered Species Act (ESA), and an Incidental Take Permit Application (ITP) will be submitted concurrently to the CDFW that will address potential impacts to species listed under the California ESA.

The proposed canal crossings addressed in this Notification (WS 8, 43, and 54 and WUS 53) are intensively managed and maintained for irrigation water conveyance and are bordered by actively cultivated fields. However, the KRFCC, which will be avoided using HDD construction, includes some ruderal habitats and natural vegetation that may provide limited habitat for special-status species, including the Buena Vista Lake shrew and the San Joaquin kit fox.

Table 2
Area of Direct Effects to Habitats and Existing Land Use Types within the Action Area

	(Acres)																		
	Project Site		Construc- tion Staging Area	Railroad Spur		Railroad Spur Laydown Yard		Natural Gas Pipeline		Process Water Supply Pipeline and BVWSD Well Field		Transmission Line/PG&E Switching Station/ Potable Water Pipeline		OEHI CO ₂ Pipeline ²	OEHI EOR Facilities ²	Total			
	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent			
Habitat/ Land Use Types ¹																			
Alfalfa	–	118.0	59.8	–	1.7	5.3	2.0	–	3.4	–	5.9	1.15	2.8	3.29	–	–	75.6	127.74	
Other Row Crop	–	317.3	20.0	–	3.5	16.2	–	–	9.4	0.23	1.7	–	–	–	–	–	34.6	333.73	
Orchards	–	–	–	–	1.1	4.5	–	–	0.6	–	2	–	0.7	0.01	–	–	4.4	4.51	
Natural/ Ruderal	–	–	–	–	–	–	–	–	3.7	–	–	–	–	–	28.89	0.11	32.59	63.90	
Developed/ Disturbed	–	17.7	11.2	–	3.3	12.4	1.0	–	30.1	–	79.5	–	3.7	0.85	–	–	128.8	30.95	
Total	–	453.0	91.0	–	9.6	38.4	3.0	–	47.2 ³	0.23	89.1	1.15 ⁴	7.2	4.15	28.89	0.11	63.79	275.99	560.83

Notes:

- Areas not designated as crop land or Natural/Ruderal land have been classified as Developed/Disturbed.
- Source: DOE Data Request – Initial Injection Phase Project Description (Stantec, 2012c).
- The area of temporary habitat disturbance along the portion of the natural gas linear that follows the railroad spur from the Project Site to the interconnection of the railroad with the existing San Joaquin Valley Railroad line is included in the temporary effects for the railroad spur.
- The area that would be permanently affected is based on five wells that would occupy approximately 100 feet by 100 feet each. The exact well locations are not known, but the entire area is assumed to be within alfalfa fields.

BVWSD = Buena Vista Water Storage District
CO₂ = carbon dioxide
DOE = Department of Energy
EOR = enhanced oil recovery
OEHI = Occidental of Elk Hills, Incorporated
PG&E = Pacific Gas and Electric Company

Table 3
Listed Species with Potential to Occur

Common Name	Scientific Name	State Status	Federal Status
Plants			
California jewel-flower	<i>Caulanthus californicus</i>	Endangered	Endangered
Kern mallow	<i>Eremalche kernensis</i>	None	Endangered
San Joaquin woollythreads	<i>Monolopia congdonii</i>	None	Endangered
Reptiles			
Blunt-nosed leopard lizard	<i>Gambelia sila</i>	Endangered/ Fully Protected	Endangered
Birds			
Swainson's Hawk	<i>Buteo swainsoni</i>	Threatened	None
Mammals			
Buena Vista Lake shrew	<i>Sorex ornatus relictus</i>	Species of Concern	Endangered
Giant kangaroo rat	<i>Dipodomys ingens</i>	Endangered	Endangered
Tipton kangaroo rat	<i>Dipodomys nitratoides nitratoides</i>	Endangered	Endangered
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	Threatened	Endangered
Nelson's Antelope Squirrel	<i>Ammospermophilus nelsoni</i>	Threatened	None

BOX 12 – DESCRIPTION OF AVOIDANCE, MINIMIZATION, AND COMPENSATION

Avoidance and Minimization

Special-Status Plant and Wildlife Avoidance and Minimization Measures would be implemented as described in Sections 2.3.4 and 2.3.5 in the BA (Appendix E, provided separately). In addition, the following erosion control measures would be implemented within the HECA Project Site:

- Strategically placed berms, swales, and culverts will be used to redirect runoff toward the stormwater retention basins.
- Sandbags, filter bales, silt fences, and/or temporary dams will be installed, as needed, to minimize the volume of sediment carried by storm runoff, and to prevent the erosion of slopes and temporary drainage facilities.
- Grades will be designed to prevent the effects of ruts and ponding.
- Following each significant precipitation event, a site review of the effectiveness of the erosion control plan will take place.

- Stormwater will be retained on site for impoundment in the stormwater retention basins, located as shown on Figure 5.

Any work within 50 feet of waters of the U.S. and/or within 15 feet of waters of the State (WS) will incorporate Best Management Practices (BMPs) to minimize fill and/or degradation of waters. BMPs would include the following:

- Signs or other markers would be used to clearly demarcate the extent of work zones.
- Refueling of construction equipment and storage of fuel or other hazardous chemicals would not occur within 50 feet of any jurisdictional waters of the U.S. or within 15 feet of waters of the State.
- Work zones would be periodically inspected to ensure that BMP practices are being adhered to.

BMPs to be implemented during construction activities for installation of the Project linears include:

- Material excavated from trenches will be stockpiled outside of any canal banks or other water features.
- Excavated trench material will generally be used as backfill.
- Temporarily disturbed canal or other water features will be returned to their pre-construction contours to the extent practicable.
- Energy dissipation devices will be used for discharging water from hydrostatic testing of the pipeline.
- Implementation of soil erosion control measures, as needed, to prevent runoff and impacts to water quality. Erosion control measures would be similar to those described for the HECA Project Site above.

In addition to the above measures, best management practices for HDD will include:

- Installation of silt fencing around the drill sites
- Selection of drilling fluids for environmental compatibility
- Removal of spent fluids from the areas immediately adjacent to the water bodies for safe disposal and to prevent contamination
- Preparation and review of a HDDP before construction (see Appendix D for a draft HDDP)
- Reporting on work adjacent to wetlands will be included in the pending Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). The BRMIMP

Supplemental Information

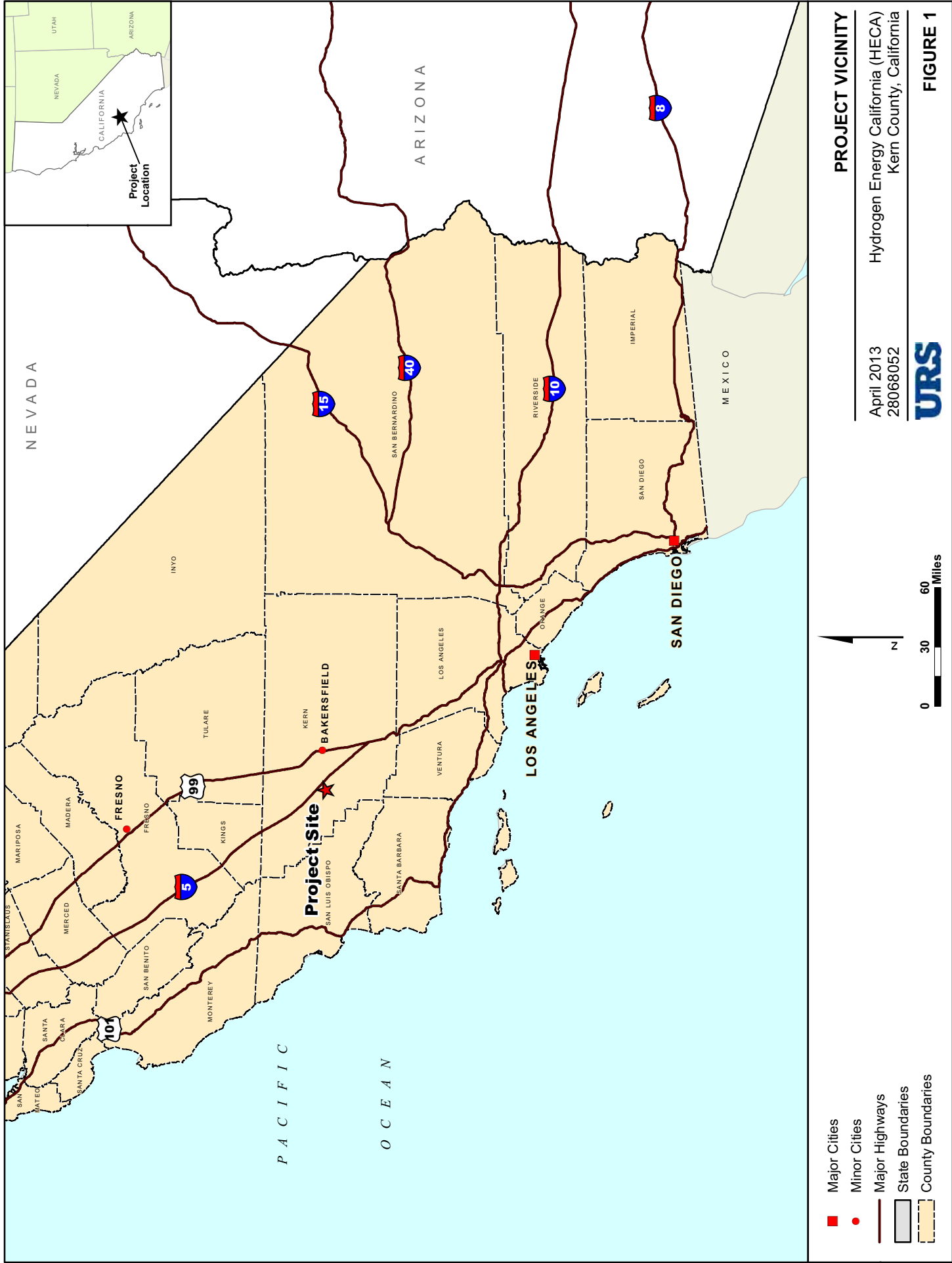
will be prepared as part of the environmental mitigation measures presented in HECA's Application for Certification. A quarterly BRMIMP report will be submitted to the CEC, CDFW, and USFWS, as specified in BIO 17 of the Application for Certification.

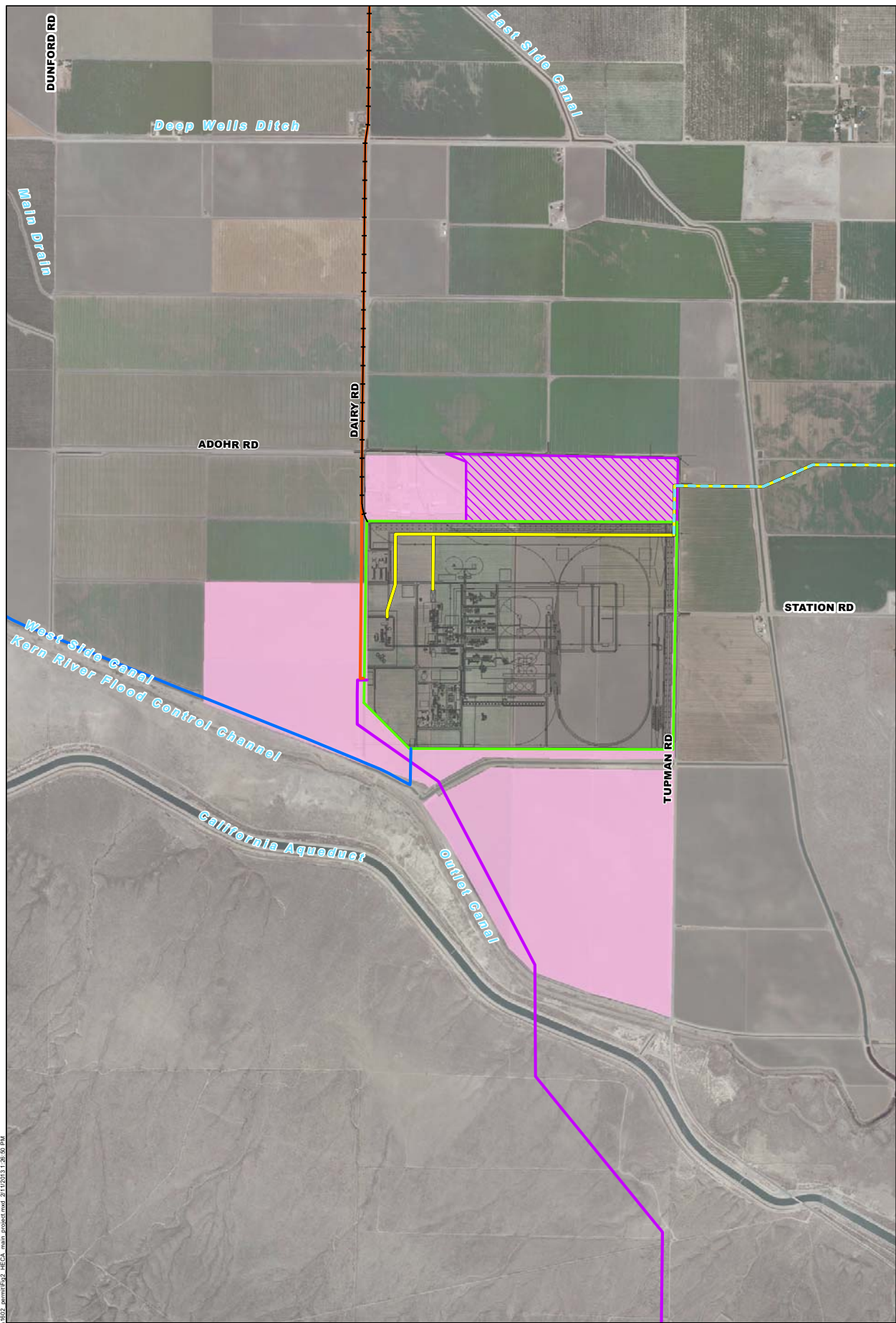
Restoration and Compensation

The water features temporarily affected during construction of the Project linears would be restored following completion of construction activities. Consistent with standard pipeline construction techniques, the upper 6 inches of soil (topsoil) excavated in non-wetland waters will be segregated and stockpiled separately from the subsoil material. The pipeline trench will be backfilled in the order in which it was removed, and topsoil will be deposited last. Trenches will be slightly overfilled to account for future soil settlement. Backfilled soil will be compacted to a bulk density consistent with the adjacent soil.

No compensatory mitigation or other compensation is proposed for temporary impacts, because they will be fully restored following completion of construction within one season. Permanent impacts to the East Side Canal would result from the placement of concrete or steel support piles for the proposed railroad bridge. However, these features would not reduce or impair the primary function of the canal to convey irrigation water during the growing season. The limited biological functions and services of the canal are not expected to be reduced due to the placement of these structures. Therefore, no compensatory mitigation is proposed for this minor permanent impact.

FIGURES

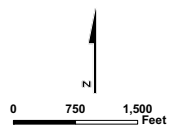




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Source: Aerial Photo, Digital Globe, 2008.

- | | |
|---|--|
| Project Site | — Carbon Dioxide |
| Construction Staging Area | — Natural Gas |
| Controlled Area | — Potable Water |
| | — Process Water |
| | —+— Railroad |
| | — Transmission |



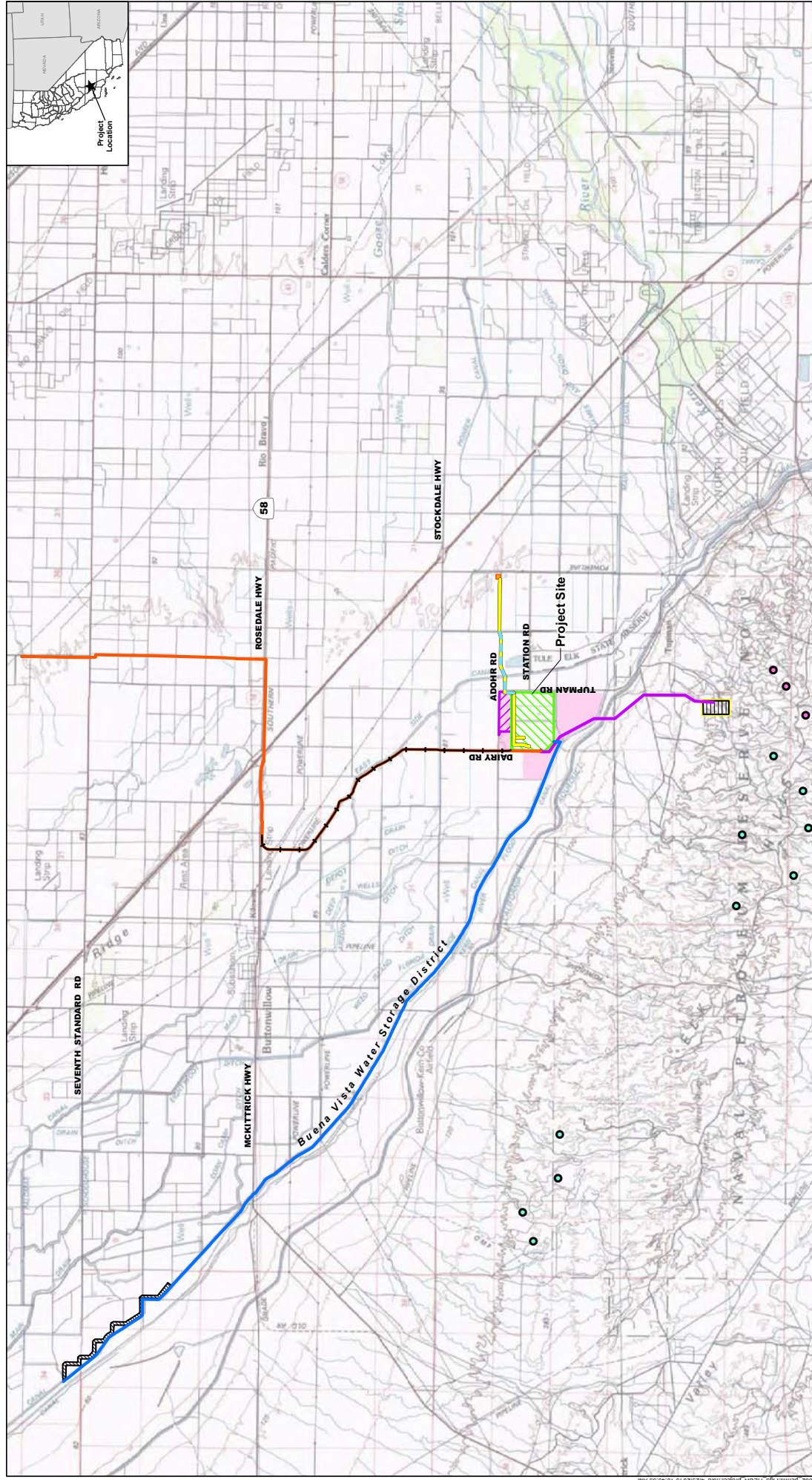
SITE PLAN

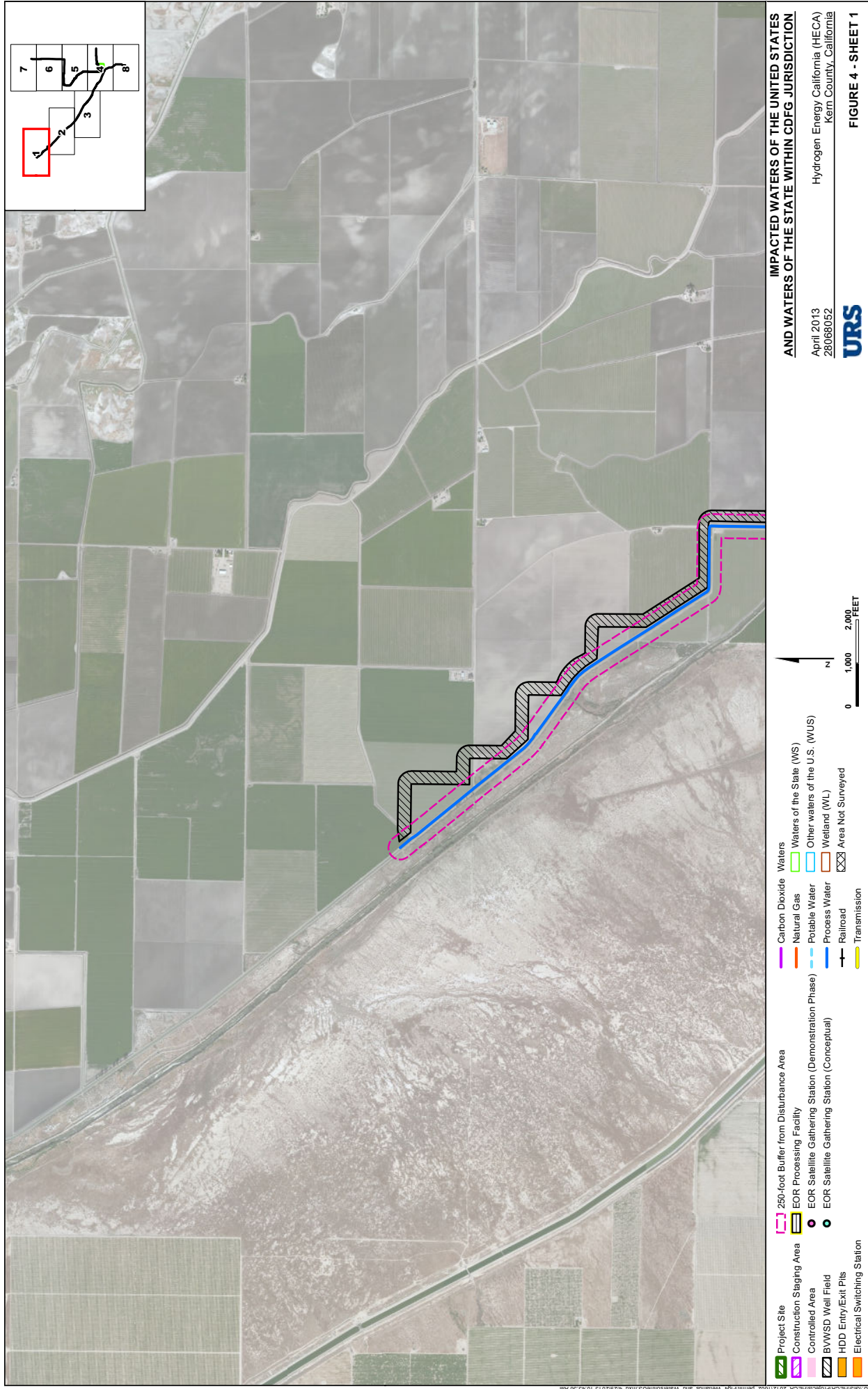
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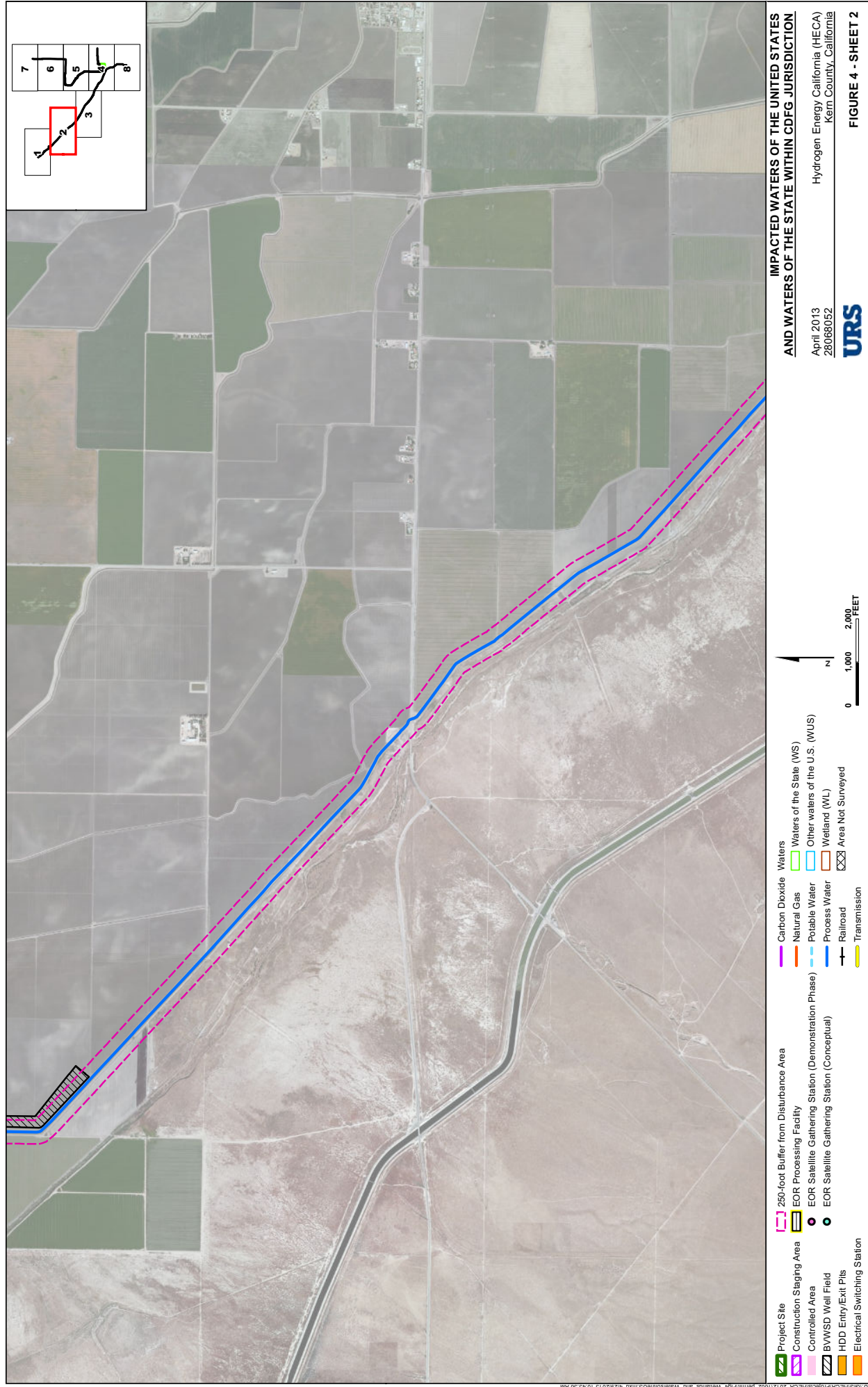
Hydrogen Energy California (HECA)
Kern County, California

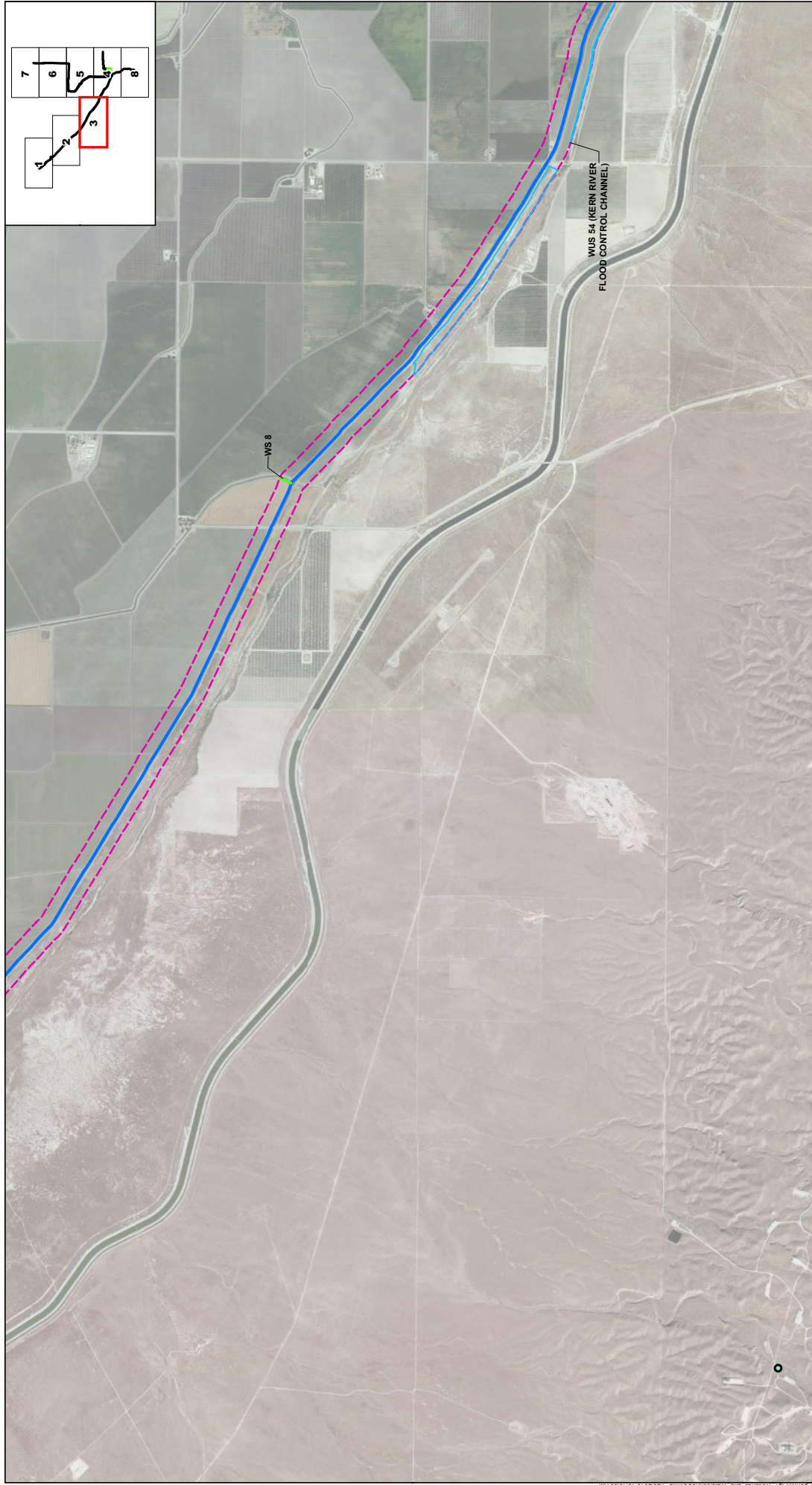


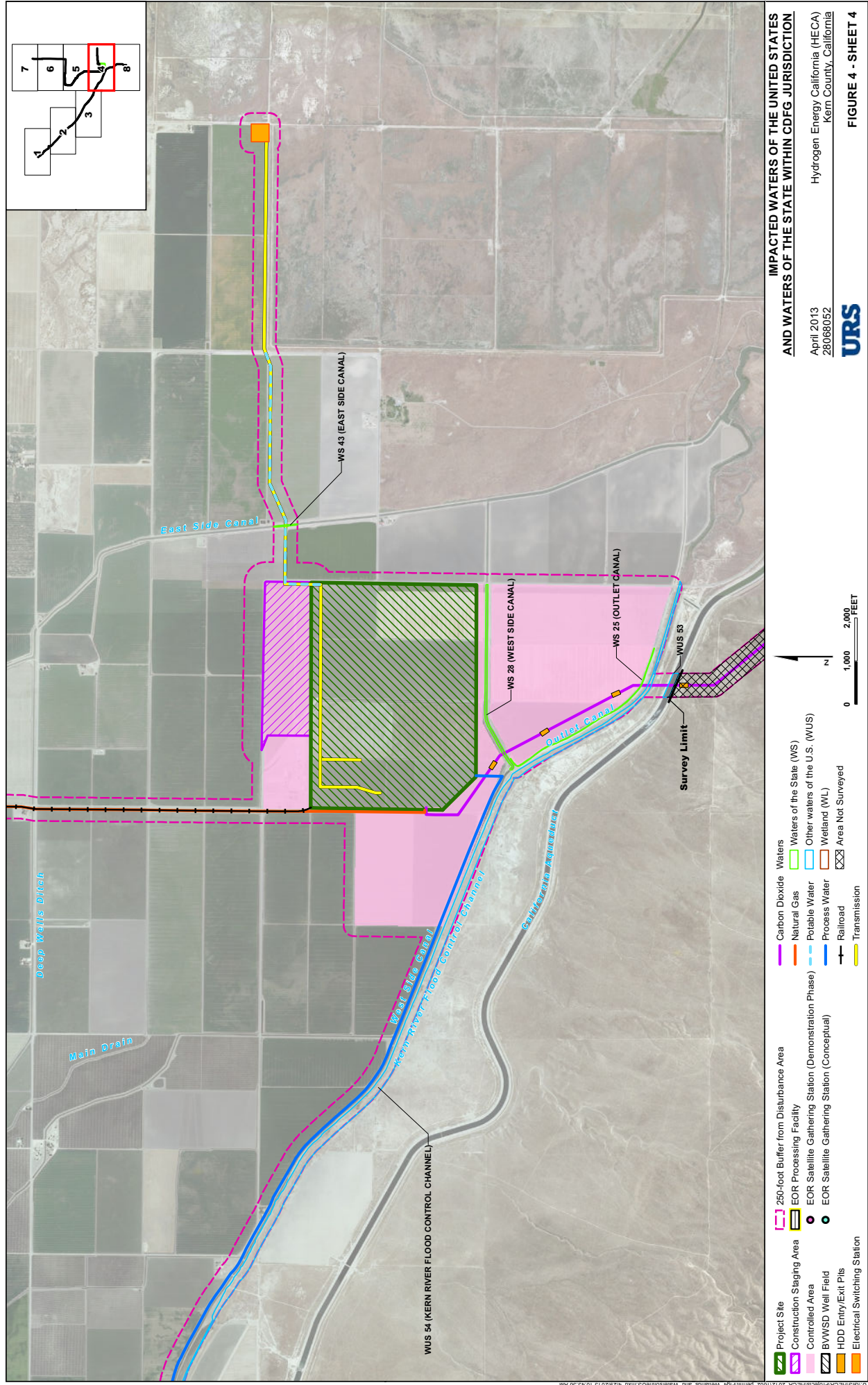
FIGURE 2

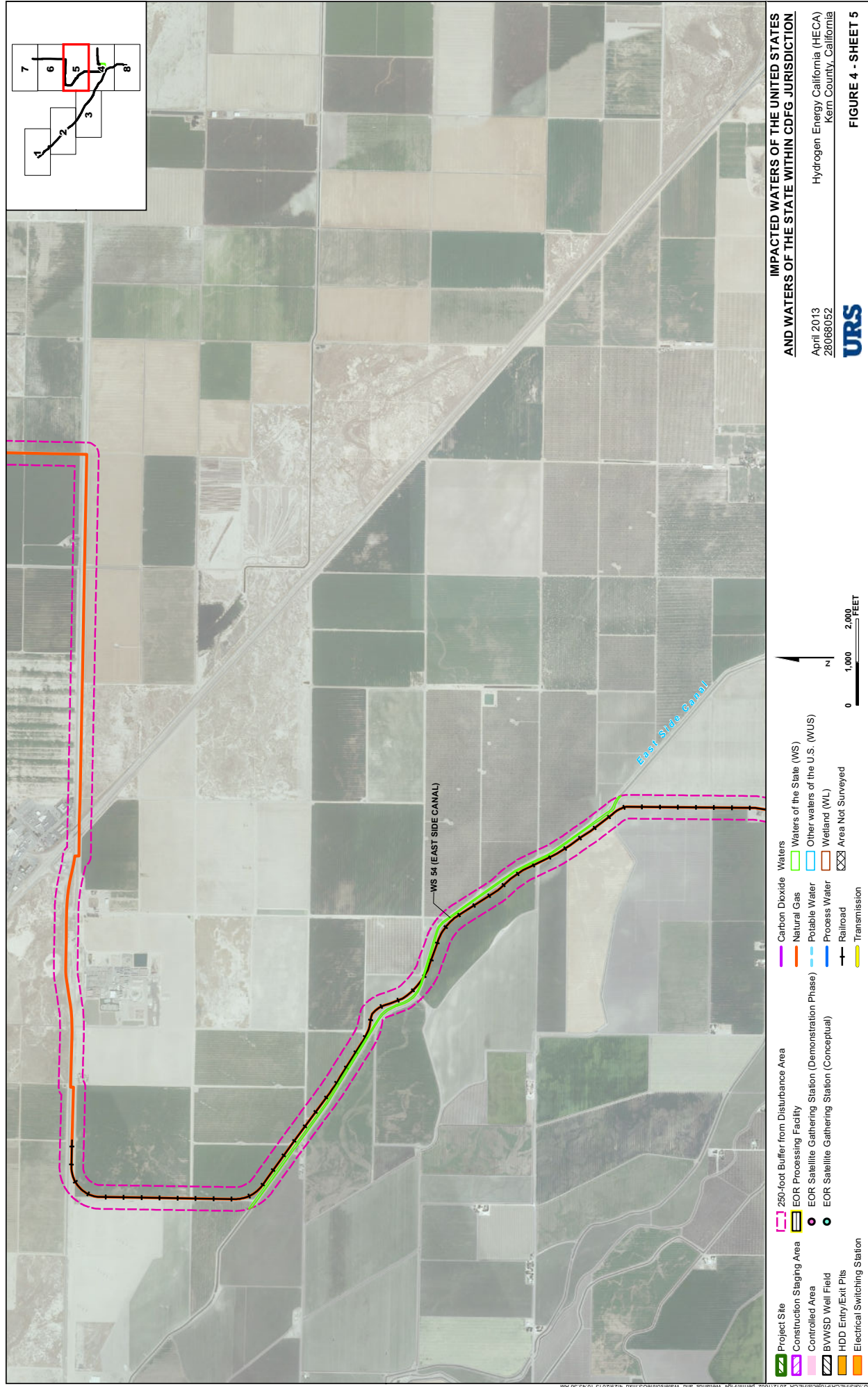














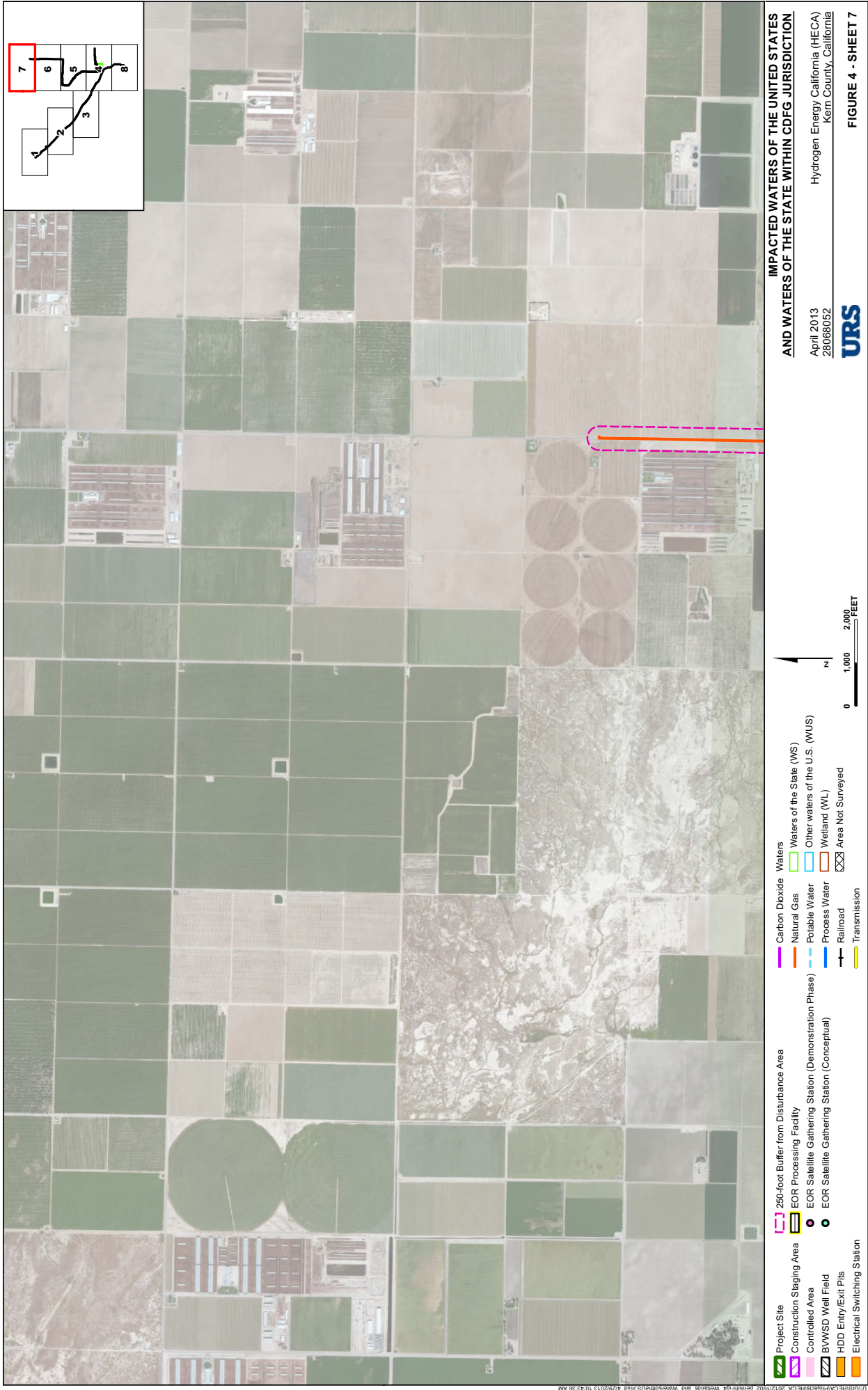
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AND WATERS OF THE STATE WITHIN CDFG JURISDICTION**

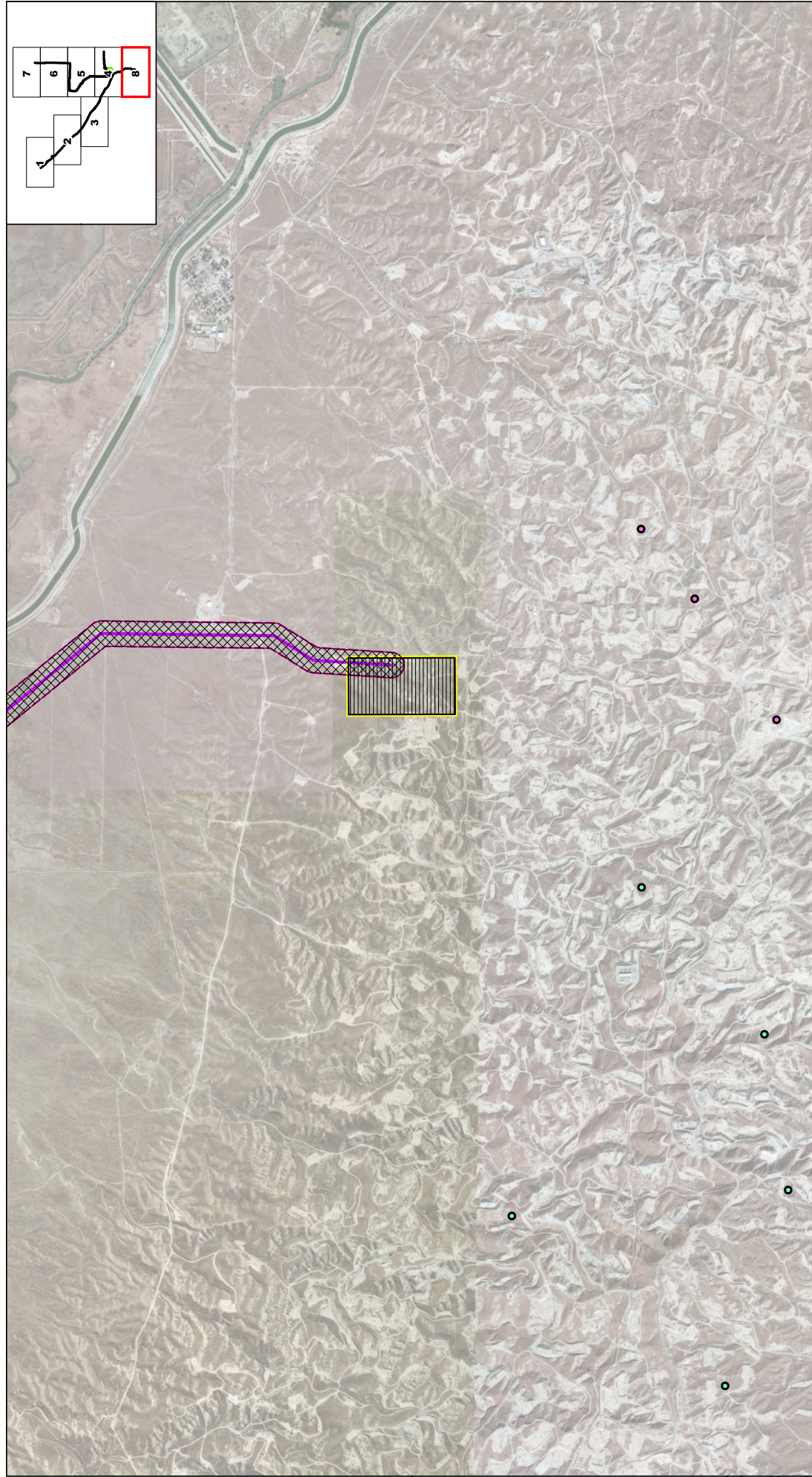
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Kern County, California



FIGURE 4 - SHEET 6

Source: Aerial Imagery, Bing Maps, 2009



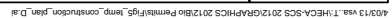



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FIGURE 4 - SHEET 8



	<p>April 2013 28068052</p>	<p>Hydrogen Energy California (HECA) Kern County, California</p>	<p>PRELIMINARY TEMPORARY CONSTRUCTION FACILITIES PLAN</p>	<p>FIGURE 5</p>
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Appendix A Project Description

**HYDROGEN ENERGY CALIFORNIA
KERN COUNTY, CALIFORNIA**

**APPENDIX A
PROJECT DESCRIPTION**

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List of Acronyms

AFC	Application for Certification
BVWSD	Buena Vista Water Storage District
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CNPS	California Native Plant Society
CO ₂	carbon dioxide
CRP	CO ₂ Recovery Plant
CTB	Central Tank Battery
DOE	U.S. Department of Energy
EHOF	Elk Hills Oil Field
EOR	enhanced oil recovery
HCP	Habitat Conservation Plan
HDD	horizontal directional drilling
HECA	Hydrogen Energy California
KRFCC	Kern River Flood Control Channel
MOU	Memorandum of Understanding
OEHI	Occidental of Elk Hills, Incorporated
PG&E	Pacific Gas and Electric Company
Project	HECA power generating facility
RCF	Reinjection Compression Facility
ROW	right-of-way
syngas	synthesis gas
USFWS	U.S. Fish and Wildlife Service
WKWD	West Kern Water District

1.0 PROJECT DESCRIPTION

Hydrogen Energy California (HECA) LLC is proposing an Integrated Gasification Combined-Cycle polygeneration project (hereafter referred to as the HECA Project). HECA LLC is owned by SCS Energy California LLC. The HECA Project will gasify a 75 percent coal and 25 percent petroleum coke fuel blend to produce synthesis gas (syngas). Syngas produced via gasification will be purified to hydrogen-rich fuel, which will be used to generate low-carbon baseload electricity in a Combined-Cycle Power Block; low-carbon nitrogen-based fertilizer in an integrated Manufacturing Complex; and carbon dioxide (CO₂) for use in enhanced oil recovery (EOR).

The fertilizer and power produced by the HECA Project have a low-carbon footprint, because more than 90 percent of the CO₂ in the syngas is captured and approximately 3 million tons per year of CO₂ is transported via pipeline for use in EOR, which results in simultaneous sequestration (storage) of the CO₂ in a secure geologic formation (HECA, 2012). CO₂ will be transported for use in EOR in the adjacent Elk Hills Oil Field (EHOF), which is owned and operated by Occidental of Elk Hills, Inc. (OEHI) (hereafter referred to as the OEHI Project).

The U.S. Department of Energy (DOE) is providing financial assistance to the HECA Project under the Clean Coal Power Initiative Round 3 via a cost-sharing agreement with HECA LLC, covering project construction and a “Demonstration Period” for the first 2 years of project operations.

The 453-acre HECA Project Site is approximately 7 miles west of the city of Bakersfield, and approximately 2 miles northwest of the unincorporated community of Tupman in western Kern County, California (Figure 1, Project Location). The HECA Project Site is adjacent to the EHOF (Figure 2, Project Vicinity). HECA has an agreement to purchase the HECA Project Site, as well as an additional 653 acres adjacent to the HECA Project Site, herein referred to as the Controlled Area (Figure 3, Project Site Map). The HECA Project Site and Controlled Area are currently used for farming purposes, including the cultivation of cotton, alfalfa, and onions.

In addition to the Project Site, the HECA Project includes construction and operation of five linear facilities, which include (1) an approximately 2-mile-long electrical transmission line to a new Pacific Gas and Electric Company (PG&E) switching station; (2) an approximately 13-mile-long natural gas interconnection with an existing PG&E natural gas pipeline; (3) an approximately 15-mile-long process water supply pipeline from the Buena Vista Water Storage District (BVWSD); (4) an approximately 1-mile-long potable water supply pipeline from West Kern Water District (WKWD); and (5) an approximately 5-mile-long industrial railroad spur that will connect to the San Joaquin Valley Rail Road.

The OEHI Project will include construction and operation of three primary EOR components, including (1) an approximately 3.4-mile-long CO₂ Pipeline from HECA to the EHOF; (2) a CO₂ EOR Processing Facility at the southern terminus of the CO₂ Pipeline; and (3) three Satellite Gathering Stations.

Construction activities associated with each of the HECA and OEHI project components, including avoidance, minimization, and conservation measures, are described below, followed by descriptions of operation and maintenance of the facilities and the project schedule.

1.1 CONSTRUCTION ACTIVITIES

This section describes the construction activities associated with the proposed action. The activities are organized by location.

1.1.1 Power Generating Facility

The 453-acre HECA Project Site is intensively cultivated for the production of alfalfa, cotton, and onions, and has little habitat value for native flora and fauna. In addition, the closest area with habitat value for native flora and fauna is the Kern River Flood Control Channel (KRFCC), approximately 700 feet south of the HECA Project Site. The majority of the 653-acre Controlled Area may remain in active agriculture and act as a buffer between the Project and the KRFCC. The western border of the Tule Elk State Natural Reserve is approximately 1,700 feet to the east of the HECA Project Site.

Construction activities for the HECA Project will occur throughout the 42-month construction period. All construction laydown and parking areas will be within the HECA Project Site and the Controlled Area. Onsite construction activities include clearing and grubbing, grading, hauling, layout of equipment, delivery and handling of materials and supplies, and HECA Project construction and testing operations. The HECA Project Site occurs in an area of relatively flat topography. Site grading will occur as necessary to form level building pads for major process units.

Construction site access will be via Dairy Road for truck deliveries and Adohr Road for construction craft vehicles arriving and departing the site. Initial site preparation will include construction of temporary access roads, parking, laydown areas, office and warehouse facilities, installation of erosion control measures, and other improvements necessary for construction. Erosion control measures will include construction of stormwater retention basins and related site drainage facilities to control runoff within the HECA Project Site boundary. Existing drainage patterns outside the HECA Project Site boundary will remain unchanged, and no runoff from outside the HECA Project Site boundary will flow onto the HECA Project Site.

1.1.2 Electrical Transmission Line

An electrical transmission line will interconnect the HECA Project to PG&E's future switching station. The transmission line will be constructed and owned by HECA up to the point of interconnection. The power generated by the HECA Project will be connected to the existing PG&E system by a single-tower, 230-kilovolt transmission line that will be constructed as part of the HECA Project. This single-circuit line will be connected to a new switchyard at the HECA Project Site.

The proposed electrical transmission line route is approximately 2 miles long to HECA's property boundary, and passes through previously disturbed areas or active agriculture, predominantly pistachio orchards, alfalfa, and cotton. Construction of the line will require installing approximately 26 (15 offsite and 11 onsite) tubular-steel transmission structures and the supporting foundations.

The electrical transmission line route extends east from the HECA Project Site to a new PG&E switching station (adjacent to the existing Midway-Wheeler Ridge transmission lines) as shown on Figure 4, Project Location Details. The new PG&E switching station will be constructed at the eastern terminus of the electrical transmission line, approximately 2 miles east of the HECA Project Site and next to Elk Valley Road. Access to the switching station site would be along an existing unimproved farm road from Morris Road or Elk Valley Road. The electric transmission switching station will be designed, constructed, owned, and operated by PG&E.

The area occupied by the PG&E switching station will be approximately 417 feet by 417 feet. Portions of the site will be excavated to install a grounding grid, underground control and protection cabling, and foundations. It is anticipated that “dead-end” structures to terminate the transmission line from the HECA site would be approximately 30 feet tall near the western end of the switching station site. A similar set(s) of structures at the eastern end of the station for the incoming lines from Midway and the outgoing lines to Wheeler Ridge would also be required. The height of a two-level structure would be on the order of 50 to 60 feet tall. The station would also have structures associated with interconnecting buses and cable “drops” to the circuit breakers. The height of these structures would be on the order of 20 to 30 feet.

Approximately 15 steel poles are expected to be required outside of the HECA Project Site. Construction of the interconnection line will consist of installing footings, poles, insular and hardware, and pulling conductor and shield wires. The new transmission line interconnection will be placed in an approximately 100-foot-wide permanent right-of-way (ROW).

Construction of the new 230-kilovolt transmission line interconnection will require approximately 3 months. It will be scheduled for completion and be operational in time for generation testing of the HECA Project. HECA will provide for the transmission line via a Large Generator Interconnection Agreement up to the point of interconnection at the future PG&E switching station.

Upon completion of the linear installation, agricultural uses may be reestablished along the linear route within the 100-foot-wide permanent ROW. Orchards would be limited to 25 feet in height within the permanent ROW.

1.1.3 Natural Gas Supply

A 13-mile natural gas linear will interconnect with a PG&E natural gas pipeline north of the HECA Project Site. The interconnect will consist of one tap off the existing natural gas line, and one metering station at the beginning of the natural gas linear adjacent to a PG&E Inlet. The metering station will be up to 100 feet by 100 feet, and 8 feet tall, surrounded by a chain-link fence. In addition, there will be a metering station at the end of the natural gas linear, on the western side of the HECA Project Site, and a pressure-limiting station on the HECA Project Site. PG&E will construct and own the natural gas pipeline.

The majority of the natural gas linear extends across areas used for active agriculture and existing roadways. However, the natural gas linear is adjacent to several areas with natural habitat value near Interstate 5 and at the northern terminus near Magnolia Avenue.

The natural gas linear would require a 50-foot construction ROW and a 25-foot permanent ROW; however, most of the ROW would be located within cultivated fields or other disturbed habitat types adjacent to paved and unpaved roads.

Wetland features adjacent to the proposed natural gas linear ROW will be avoided. Non-wetland potential waters of the United States within the natural gas pipeline construction limits are degraded, seasonally ponded claypan depressions. If avoidance of non-wetland waters is not feasible, the feature(s) will be temporarily disturbed by the construction activities during installation of the natural gas pipeline, and the site will be restored to pre-construction condition.

Construction of the natural gas pipeline interconnection will involve a variety of crews performing the following typical pipeline construction activities: hauling and stringing the pipe along the route; welding, radiographic inspection, and coating the pipe welds; trenching; lowering the pipe into the trench; backfilling the trench; hydrostatic testing of the pipeline; tying into the existing pipeline; purging the pipeline; and cleaning up and restoring construction areas. Roads and ROWs will be restored to specifications of the involved agencies. Open trenching will be minimized, and trenches will be covered or ramped when left overnight. In areas with habitat value and in agricultural areas, the topsoil from the trenching will be set aside, preserved, and used to cover the excavation.

Construction of the natural gas pipeline interconnection will take approximately 6 months. It will be scheduled to be finished and operational in time to provide test gas to the HECA Project. Construction will occur in accordance with a traffic management plan to minimize impacts to traffic traveling on the affected roadways. Affected areas will be restored to their original state so as to minimize erosion.

1.1.4 Water Supply Pipelines

For process water, the HECA Project will use brackish groundwater supplied by the BVWSD via a new 15-mile pipeline. Potable water for drinking and sanitary use will be supplied by WKWD, who will construct a new 1-mile pipeline for that purpose. Installation of the process water and potable water pipelines will involve industry standard construction activities for pipelines, including trenching; hauling and stringing of pipe along the routes; welding; radiographic inspection and coating of pipe welds; lowering welded pipe into the trench; hydrostatic testing; and backfilling and restoring the approximate surface grade. Construction of the water pipelines is expected to take approximately 6 months to complete.

Process Water Supply Pipeline

For process water, the HECA Project will use a new 15-mile, 30-inch-diameter pipeline that will convey brackish groundwater supplied by the BVWSD. BVWSD will construct and own the process water supply pipeline, approximately 14.5 miles of which will be located in an existing BVWSD ROW. The proposed process water pipeline would be constructed entirely within an existing unpaved road or within areas that are currently actively farmed, and therefore, no direct impacts to natural habitats are anticipated. Once the process water is delivered to the HECA Project Site, the brackish water will be treated on site to meet all process and utility water

requirements. The process water supply pipeline will be approximately 15 miles in length and will be constructed by BVWSD.

In addition, BVWSD will own, construct, operate, and maintain the well field that will provide brackish groundwater for the HECA Project's process water supply. This well field will be in the northwestern portion of BVWSD's service area within active agricultural fields near the West Side Canal, in the vicinity of Seventh Standard Road, at the northern end of the 15-mile-long process water line. It is currently anticipated that there will be up to five groundwater extraction wells. Two of these wells will provide operational redundancy. The maximum depth of the wells will be approximately 300 feet below ground surface. The brackish water will be treated at the Project Site to meet all process and utility water requirements. The process water supply pipeline would require a 50-foot construction ROW and a 25-foot permanent ROW.

BVWSD addressed the groundwater extraction wells and the process water supply pipeline in their Draft and Final Environmental Impact Reports for BVWSD's Groundwater Management Program, issued in October 2009 and December 2009, respectively (BVWSD, 2009a; 2009b). The Final Environmental Impact Report for the Groundwater Management Program (State Clearinghouse No. 2009011008) concludes that the wells and the process water pipeline do not result in significant impacts to any federally listed species.

Potable Water Pipeline

For drinking and sanitary use, the HECA Project will use potable water supplied by WKWD. A new 4-inch-diameter potable water line will be constructed, owned, and maintained by HECA LLC.

The potable water line would be approximately 1 mile in length. This pipeline will require a 10-foot construction and permanent ROW that will be placed within the proposed electrical transmission line ROW. Most of the proposed ROW is within or adjacent to existing dirt access roads, or in cultivated fields.

1.1.5 Industrial Railroad Spur

The industrial railroad spur is approximately 5 miles long and will connect the HECA Project Site to the existing San Joaquin Valley Railroad Buttonwillow Branch (formerly called the SP Buttonwillow Branch). Two public at-grade crossings may be required, and several private crossings will be needed for farmers' access to croplands and the irrigation canal. The industrial railroad spur would require a 75-foot construction ROW, 60-foot permanent ROW, and 3-acre rail laydown area.

1.1.6 OEHI Carbon Dioxide Pipeline

An approximately 3.36-mile-long, 12-inch-diameter CO₂ pipeline will be constructed to transfer the CO₂ from the HECA Project Site to the OEHI CO₂ Processing Facility used by OEHI for injection into deep underground hydrocarbon reservoirs for CO₂ EOR and sequestration. Additional components of the CO₂ pipeline will include metering facilities at the pipeline origin and terminus, a cathodic protection system, and four emergency block valves. Two of the block valves will be automated and two will be manual block valves.

The CO₂ pipeline route originates at the southern portion of the HECA Project Site and will be constructed using a combination of standard open-trench installation and horizontal directional drilling (HDD). One HDD will be approximately 500 feet in length under the levees associated with the West Side/Outlet Canal crossing. A second HDD will be approximately 2,000 feet long, and will be used to install the pipeline under the KRFCC and the California Aqueduct. On the southern side of the Aqueduct, the pipeline alignment extends southeast and south to the OEHI CO₂ Processing Facility, and parallels existing private roads. OEHI will construct and own the pipeline.

With the exception of HDD crossings where the depth of the CO₂ pipeline may reach 100 feet below grade, the CO₂ Pipeline will be buried approximately 5 feet below grade. Installation of the CO₂ supply pipeline will involve typical construction activities, including trenching; hauling and stringing pipe along routes; welding; radiographic inspection and coating pipe welds; lowering welded pipe into the trench; backfill of the trench; hydrostatic testing of the pipeline; purging the pipeline; and cleanup and restoration of construction areas. Grade cuts will be restored to their original contours, and affected areas will be restored to their original condition to minimize erosion. The pipeline will be protected by cathodic protection, and monitored by independent leak-detection systems.

Construction of the CO₂ pipeline is expected to take approximately 6 months to complete. The CO₂ pipeline would require a 50- to 80-foot construction ROW and a 25-foot permanent ROW.

HDD involves using a drilling rig that will bore a horizontal hole under water crossings. At each of these crossings, a laydown area (or entry/exit pit) has been identified on either side of the water course to accommodate the HDD installation (see Figure 4, Sheet 4, Project Location Details). The temporary disturbance area would be approximately 120 feet by 100 feet for each HDD entry pit; and approximately 75 feet by 100 feet for each HDD exit pit (Stantec, 2012).

Best management practices for HDD will include silt fencing around the drill sites, energy dissipation devices for discharging water from hydrostatic testing of the pipeline, selecting drilling fluids for environmental compatibility, and removing spent fluids from the areas immediately adjacent to the water bodies for safe disposal and to prevent contamination. In addition, soil erosion control measures will be implemented to prevent runoff and impacts to water quality.

1.1.7 OEHI Carbon Dioxide EOR Processing Facility

The CO₂ from the HECA plant will be received by the CO₂ EOR Processing Facility, which will be located at the southern terminus of the CO₂ Pipeline in the southeastern quarter of Section 27S. The CO₂ EOR Processing Facility will include the Central Tank Battery (CTB), Reinjection Compression Facility (RCF), CO₂ Recovery Plant (CRP), and a Water Treatment Plant. The CO₂ EOR Processing Facility is expected to occupy and permanently disturb an area of 1,200 feet by 2,200 feet (60.61 acres).

Central Tank Battery

The CTB is the primary oil/water separation system for the CO₂ EOR process. The inlet liquid gathering lines from the Satellite Gathering Stations will be manually directed to one of the three gas separator tanks. The gas from this process will be combined with the gas from the gas separators. The oil and water will be separated, and the oil will be skimmed off and pumped to Section 18G and metered for sale. The partially treated water will be conveyed via pipeline to the existing water treating facilities.

Water Treatment Plant

The oily water from the inlet section of the CTB will be treated to remove oil, solids, and other contaminants from the produced water. The produced water will be pressurized in the injection pumps and sent to the satellites for injection. Low-pressure gas collected from the CTB will be compressed and then routed to the inlet of the RCF and the CRP for processing.

Reinjection Compression Facility

The RCF will be the first portion of the CO₂ treating/recovery facilities to be installed. Produced gas from the Satellite Gathering Stations (see Section 1.1.8) will initially flow to the RCF. At the RCF, the CO₂ gas will be dehydrated, compressed, blended with CO₂ purchased from the HECA Project, and re-injected into a closed-loop system.

CO₂ Recovery Plant

The CRP is the second part of the gas treating/recovery plant. This facility will separate CO₂ from produced hydrocarbon gas and recycle the separated CO₂. The CRP will consist of several processing units for the separation of the CO₂ from the recovered natural gas. The CRP is not expected to be constructed until 2020, and would not be part of the Demonstration Period defined by DOE.

1.1.8 OEHI Satellite Gathering Stations

The Satellite Gathering Stations (satellites, also known as Production/Well-Testing Satellites) will be a series of facilities that will provide primary separation of the oil/water and gas from the production well stream. Initially, three satellites are scheduled to be installed to handle the expected production for the first several years of the field development during the Demonstration Period. Satellites 1, 2, and 3 are each expected to have a permanent surface footprint of 230 by 200 feet. This footprint is included in the total area of the OEHI Project site evaluated in the Biological Assessment.

Each satellite will be equipped with an inlet manifold in which well flow lines associated with that satellite are connected. Flow from each well flow line will be diverted into either the production separator or the test separator via automated manual valves. The production separator is a two-phase separator to handle primary vapor liquid separation of the fluid recovered from the production wells at each satellite. The gases will be separated and routed to

the inlet of the RCF. The entire field production pressure will be controlled at the RCF inlet header, and the individual satellites will “float” on that pressure.

Liquid and gas flow rates will be metered for production trending and monitoring. The test separator will be a three-phase, bucket and weir separator to allow for a 24-hour test cycle of each well serviced by that satellite. The oil and water will be controlled by level control, and the gas will be controlled by a back-pressure controller to hold the test separator pressure slightly above that of the associated production separator. Oil, water, and gas from the test separator will be re-combined and directed to the inlet manifold and then to the production separator.

1.2 OPERATION AND MAINTENANCE

This section describes the operation and maintenance of the HECA and OEHI projects.

1.2.1 HECA Project

HECA Project operation and maintenance will occur within the HECA Project Site. The adjacent Controlled Area will remain in active agriculture similar to the existing condition. Access to linears will be limited in nature, and will be along existing access roads or access roads developed during initial installation activity. HECA LLC will own, operate, and maintain the approximately 2-mile transmission line up to the interconnection with a future PG&E switching station. It is anticipated that annual maintenance of the electrical transmission line will be provided for under an agreement between PG&E and the Project. The electrical transmission line is located entirely within areas that are actively farmed or are developed. Most of the maintenance will be routine and can be scheduled during periods when damage to the crops and land can be minimized. Maintenance activities will be conducted by personnel trained to be aware of the presence of sensitive wildlife.

PG&E will own, operate, and maintain the natural gas pipeline. Maintenance of the natural gas pipeline would follow PG&E corporate policies and protocols. Long-term maintenance needs of the natural gas pipeline would be minimal during the 25-year lifespan of the Project; therefore, they are not quantified in this document.

BVWSD will own, operate, and maintain the approximately 15-mile-long, 30-inch-diameter process water pipeline and associated wells. Annual maintenance of the process water pipeline and associated groundwater wells would be conducted by BVWSD. Maintenance activities of the wells and the pipeline would follow BVWSD corporate policies and protocols. Long-term maintenance needs of the process water pipeline would be minimal during the 25-year lifespan of the Project, and therefore is not quantified in this document.

HECA LLC will own, operate, and maintain the approximately 1-mile potable water pipeline. Maintenance activities of the pipeline would include:

- Annual reconnaissance of the pipeline ROW;
- Annual inspection and exercising (opening and closing for one cycle) of valves, as necessary;

- Annual vegetation removal, re-grading, and application of dirt for the access road after wet periods and pipe work, as necessary; and
- Replacement of pipeline components (lining and coating, valves, and joints), as determined necessary by routine inspection.

Long-term maintenance needs of the potable water pipeline would be minimal during the 25-year lifespan of the HECA Project; therefore, they are not quantified in this document.

HECA LLC currently anticipates that it will own, operate, and maintain the approximately 5-mile railroad spur. Regardless of final ownership of the spur, maintenance activities will consist of routine annual maintenance activities and programmed maintenance conducted on a periodic basis. Annual maintenance activities consist of visual inspections, vegetation control, spot surfacing and lining of rough spots in the track, and adjusting/lubrication of turnouts. In addition, any warning devices at road crossings will be inspected as frequently as monthly.

Programmed major maintenance consists of surfacing and lining the rail line, typically every 3 to 5 years; replacing the rail, potentially once during the life of the HECA Project; and replacing 15 percent of the timber ties on a 10-year cycle. If concrete ties are used, the ties will not need to be replaced. Major maintenance activities will be conducted using on-track equipment. Replaced materials will be removed from the ROW and recycled. Timber ties will be disposed of by incineration, landfill disposal, or other approved disposal options.

1.2.2 OEHI Project

OEHI will own, operate, and maintain the CO₂ pipeline and the related components of the OEHI Project. Maintenance of the CO₂ pipeline and other EOR facilities will follow existing OEHI operational procedures, as required by the existing U.S. Fish and Wildlife Service (USFWS) Biological Opinion and the related 1997 Memorandum of Understanding (MOU) between OEHI and the California Department of Fish and Game (CDFG) that has twice been updated, and remains in effect until 2014 (CDFG, 1997; 1999; 2010). The EOR facility operations will be similar to the existing facility operations by OEHI at the EHOE. Operations activities include facility inspection and maintenance. Maintenance needs of the CO₂ pipeline and associated EOR facilities would be minimal during the Demonstration Period of the Project; therefore, they are not quantified in this document.

1.3 PROPOSED CONSERVATION MEASURES

This section describes the conservation measures that are included in the HECA Project and the OEHI Project to avoid, minimize, and/or compensate for impacts on listed species.

1.3.1 HECA Project Design Modifications

The HECA Project design has been refined in coordination with the resource agencies and environmental specialists to avoid and minimize impacts on sensitive biological resources to the extent practicable. These measures include relocating the HECA Project Site from the originally proposed location to its current location across the Aqueduct to reduce impacts to the blunt-nosed leopard lizard; and relocating the natural gas pipeline to avoid portions of the Coles Levee Ecosystem Preserve. In addition, the potable water linear and electrical transmission linear were

shortened and relocated to the east of the HECA Project Site, which avoided impacts to 1.9 acres of Allscale Scrub habitat.

The HECA Project also includes general and species-specific measures to avoid and minimize impacts on listed species and their habitat. For potential impacts on listed species that remain after implementation of feasible avoidance and minimization measures, comprehensive compensatory measures through habitat enhancement, establishment, and preservation are included in the Project to offset potential losses of listed species or their habitat. HECA LLC is committed to implementing these measures as part of the Project. These conservation measures are extracted from the Amended Application for Certification (AFC) submitted to the California Energy Commission (CEC) in May 2012, and the corresponding numbers or mitigation measures from the 2012 Amended AFC (e.g., BIO-1, BIO-2, etc.) are provided where applicable.

1.3.2 OEHI Project Design

The proposed CO₂ pipeline crossings of the West Site Canal/Outlet Canal, the KR FCC, and the California Aqueduct will be constructed using HDD to avoid direct and indirect effects to species movement and dispersal at these locations.

OEHI will minimize impacts associated with the OEHI Project by using existing wells and previously disturbed areas to the maximum extent feasible. Avoidance and minimization will also be achieved by minimizing future land disturbance on those portions of the EHOFF considered high value on the Habitat Conservation Plan (HCP) multi-species map. The OEHI Project will also be implemented in compliance with the 1995 Biological Opinion issued by the USFWS, and a related 1997 MOU between OEHI and the CDFG, as updated. Finally, the OEHI Project will be implemented in compliance with a 50-year HCP for the EHOFF, which is currently under development and anticipated to be approved by the end of 2013.

1.4 PROJECT SCHEDULE

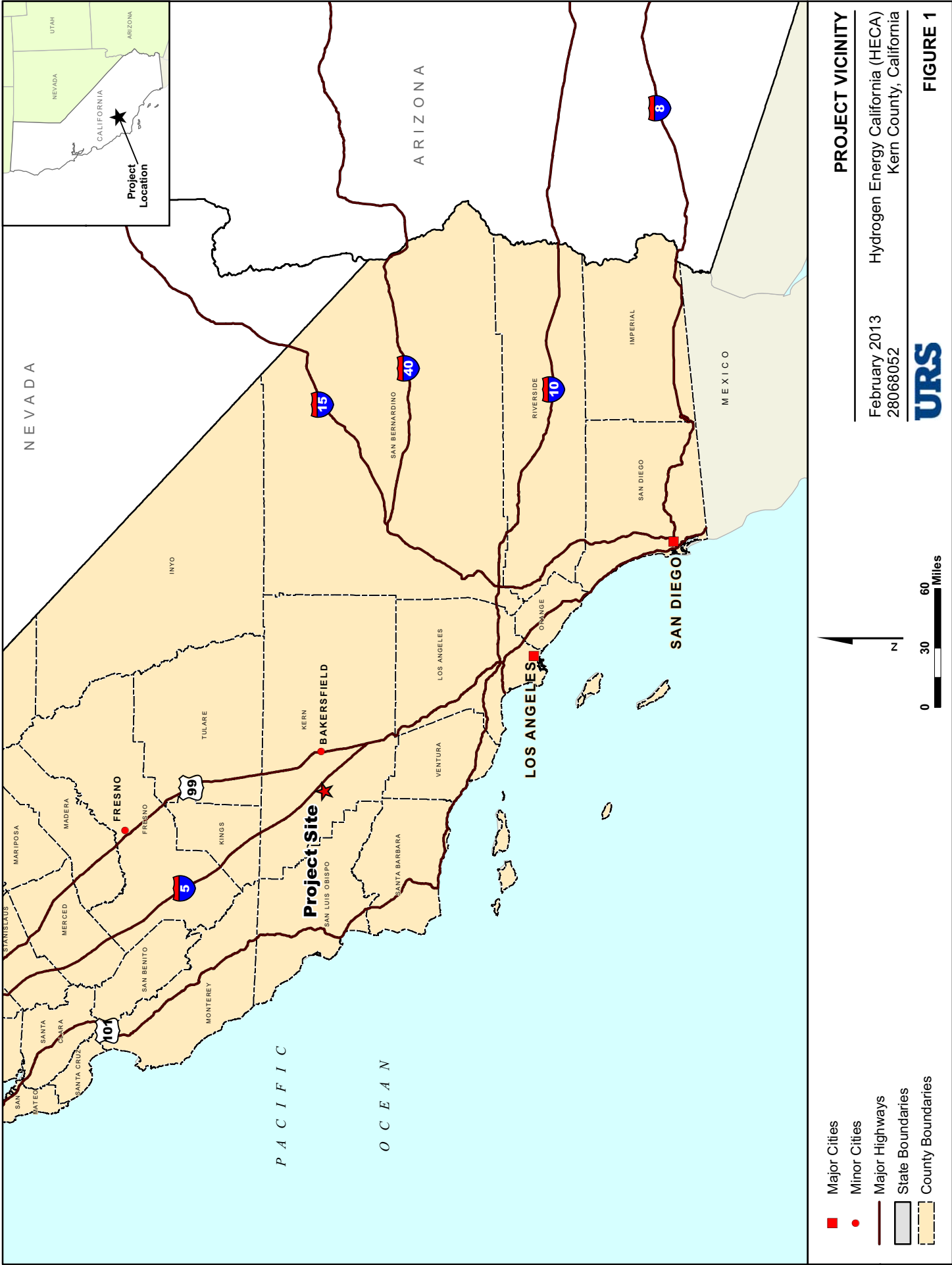
The anticipated schedule milestones for the Project are as follows:

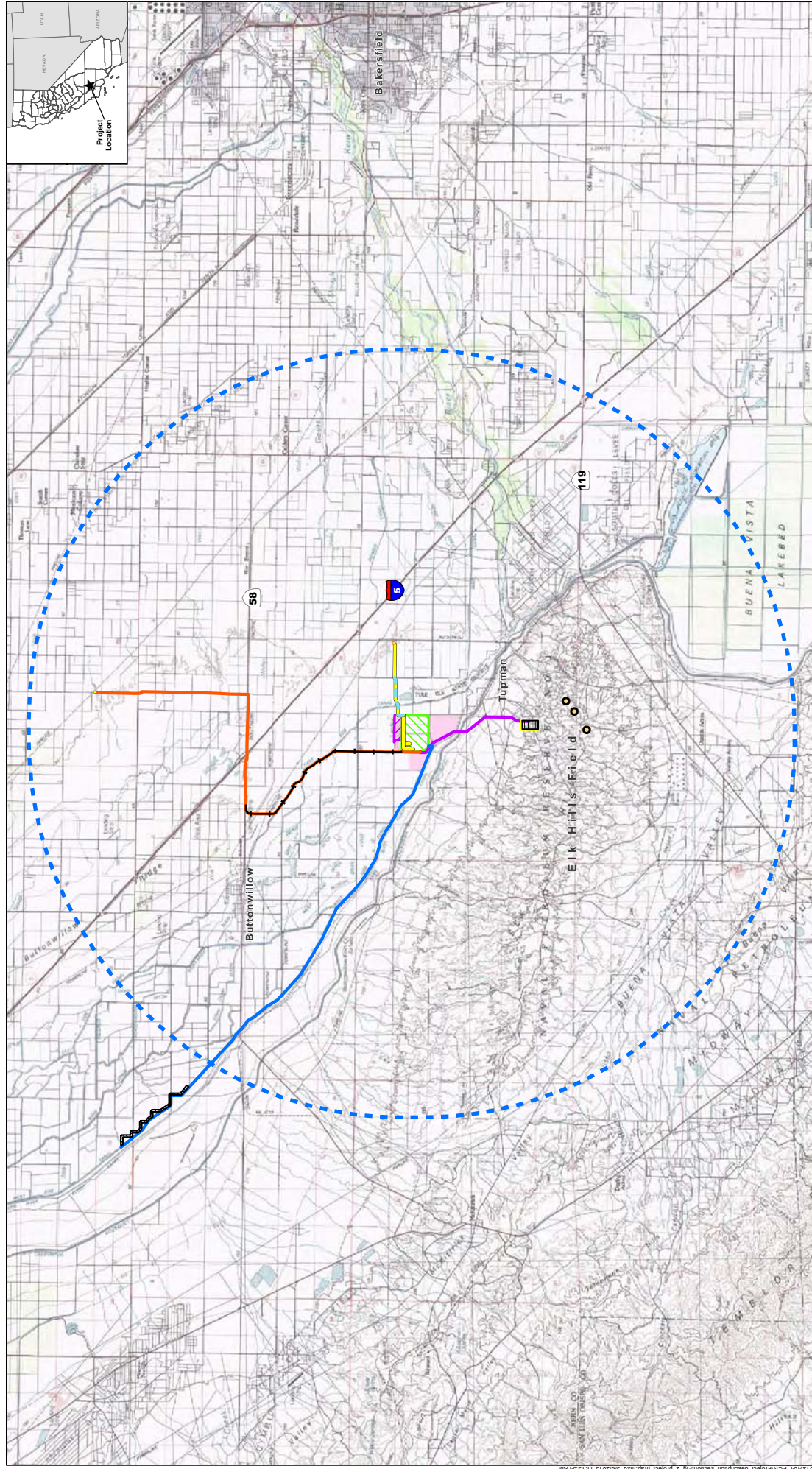
USFWS finalizes Biological Opinion	May 2013
Completion of CEC permitting process	late 2013
Commencement of pre-construction and construction activities.....	late 2013
Commencement of commercial operation of the Project.....	2017

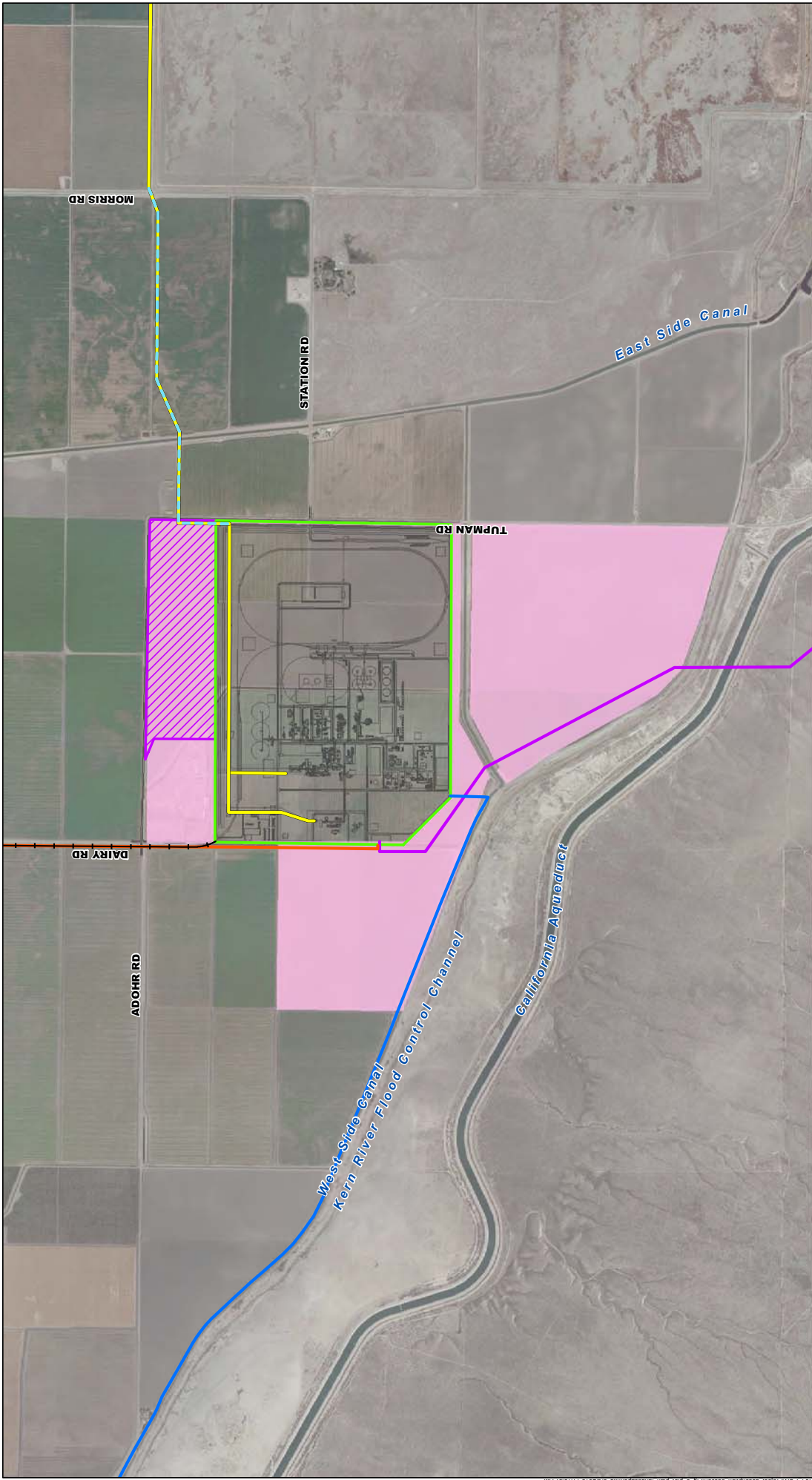
2.0 REFERENCES

- BVSWD (Buena Vista Water Storage District), 2009a. Draft Environmental Impact Report for the Buena Vista Water Storage District Buena Vista Water Management Program (State Clearinghouse No. 2009011008). Buttonwillow, California. October 2009.
- BVSWD (Buena Vista Water Storage District), 2009b. Final Environmental Impact Report for the Buena Vista Water Storage District Buena Vista Water Management Program (State Clearinghouse No. 2009011008). Buttonwillow, California. December 2009.
- HECA (Hydrogen Energy California) LLC, 2012. Amended Application for Certification for Hydrogen Energy California, Kern County, California. Submitted to the California Energy Commission. Prepared by URS Corporation. May 2012.
- Stantec (Stantec Corporation), 2012. Modified CO₂ Supply Line Alignment Data Gap Analysis. Prepared for Occidental of Elk Hills, Inc. April.
- USFWS (U.S. Fish and Wildlife Service), 1999. Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to Ground Disturbance. URL: http://www.fws.gov/sacramento/es/documents/kitfox_standard_rec.pdf.

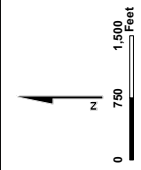
FIGURES

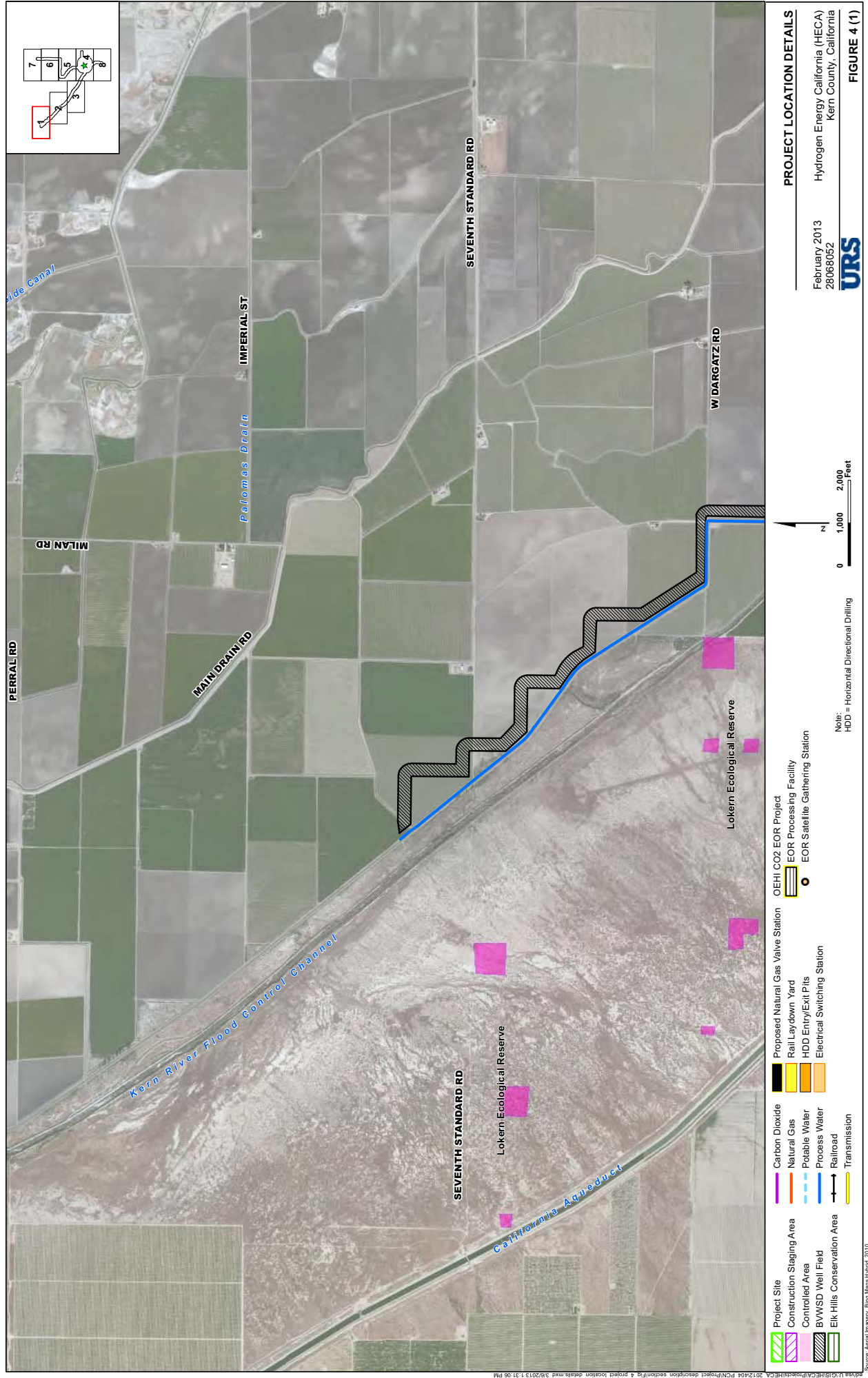


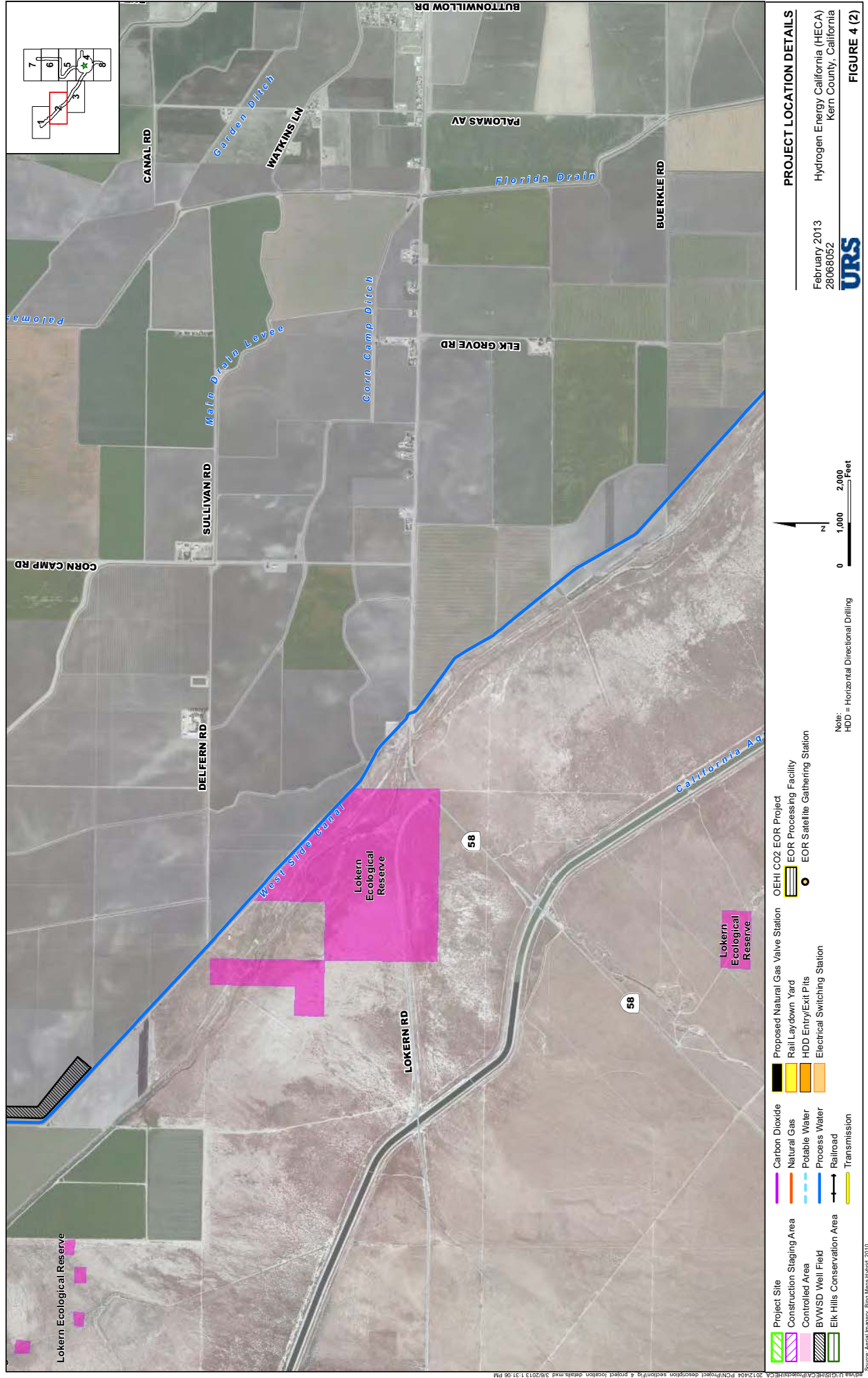


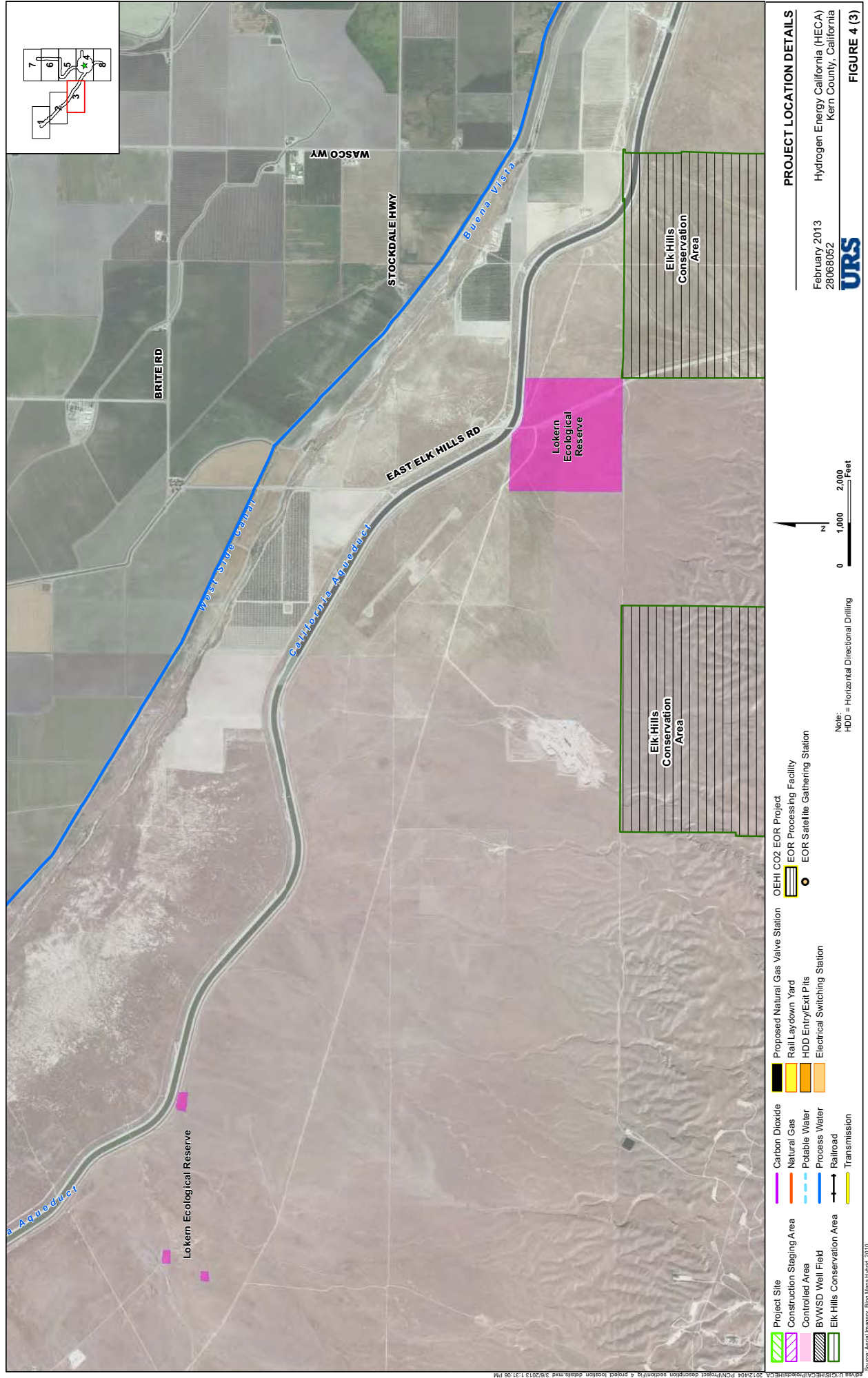


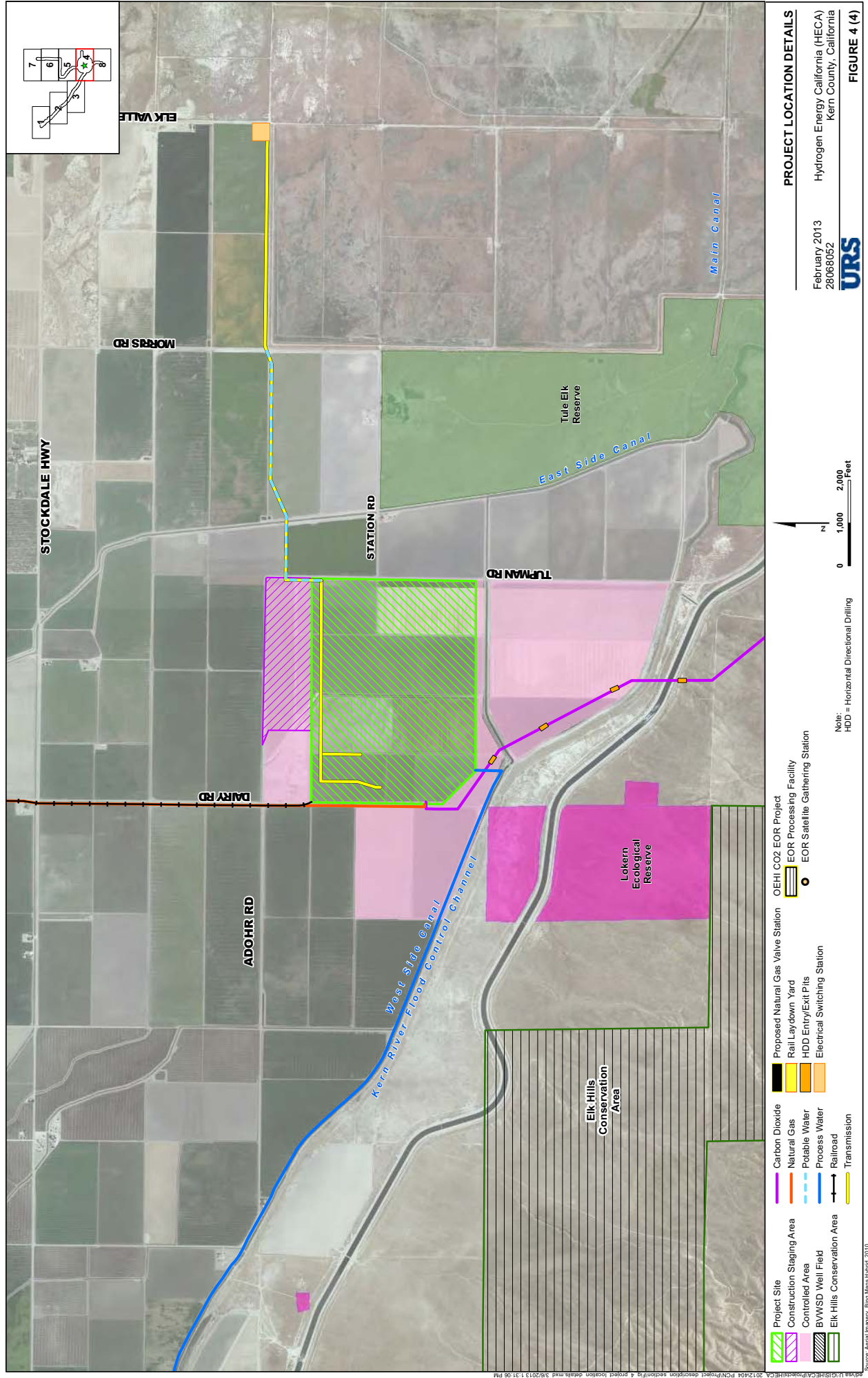
- Project Site
- Construction Staging Area
- Controlled Area
- Carbon Dioxide
- Natural Gas
- Potable Water
- Process Water
- Railroad
- Transmission

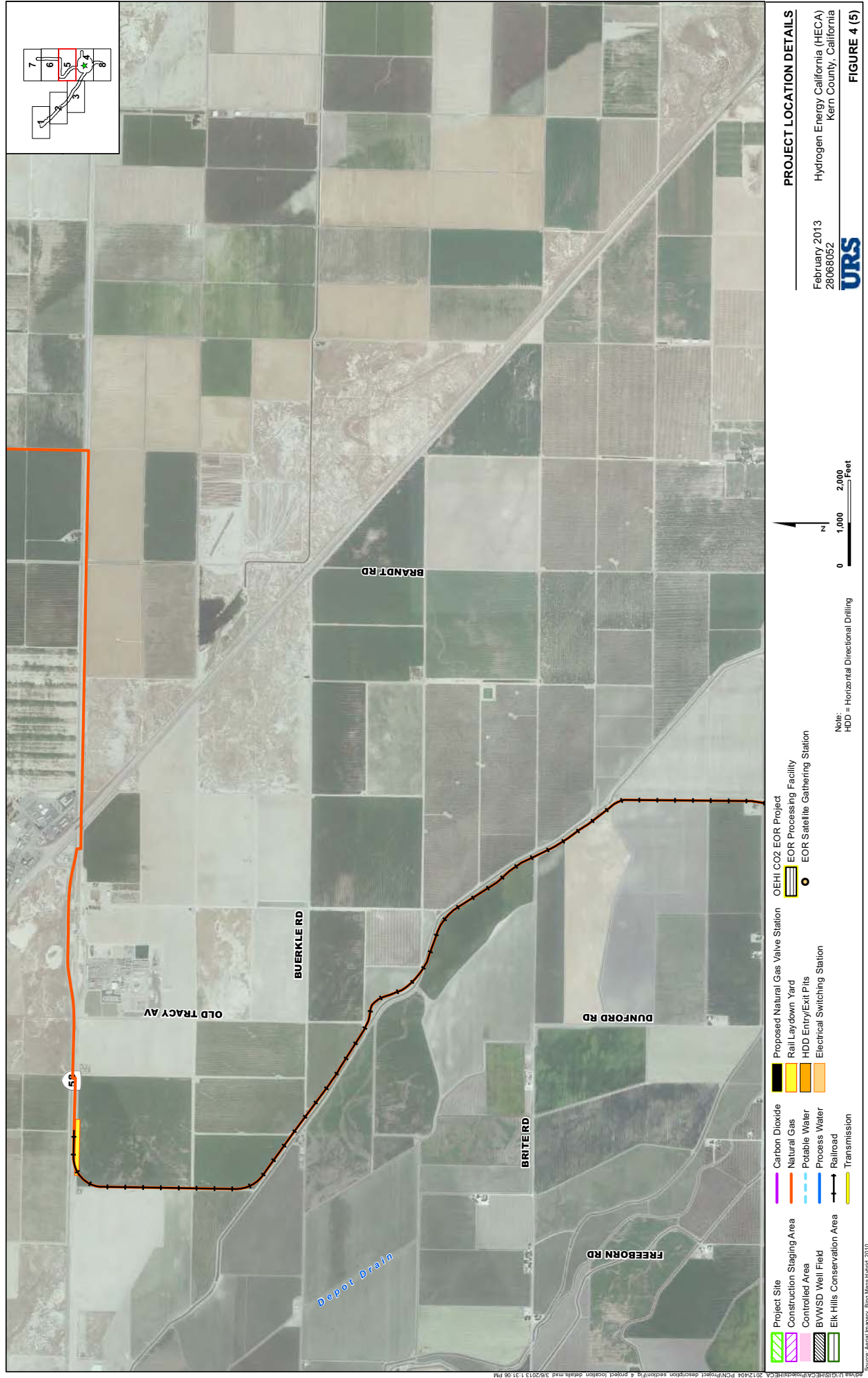


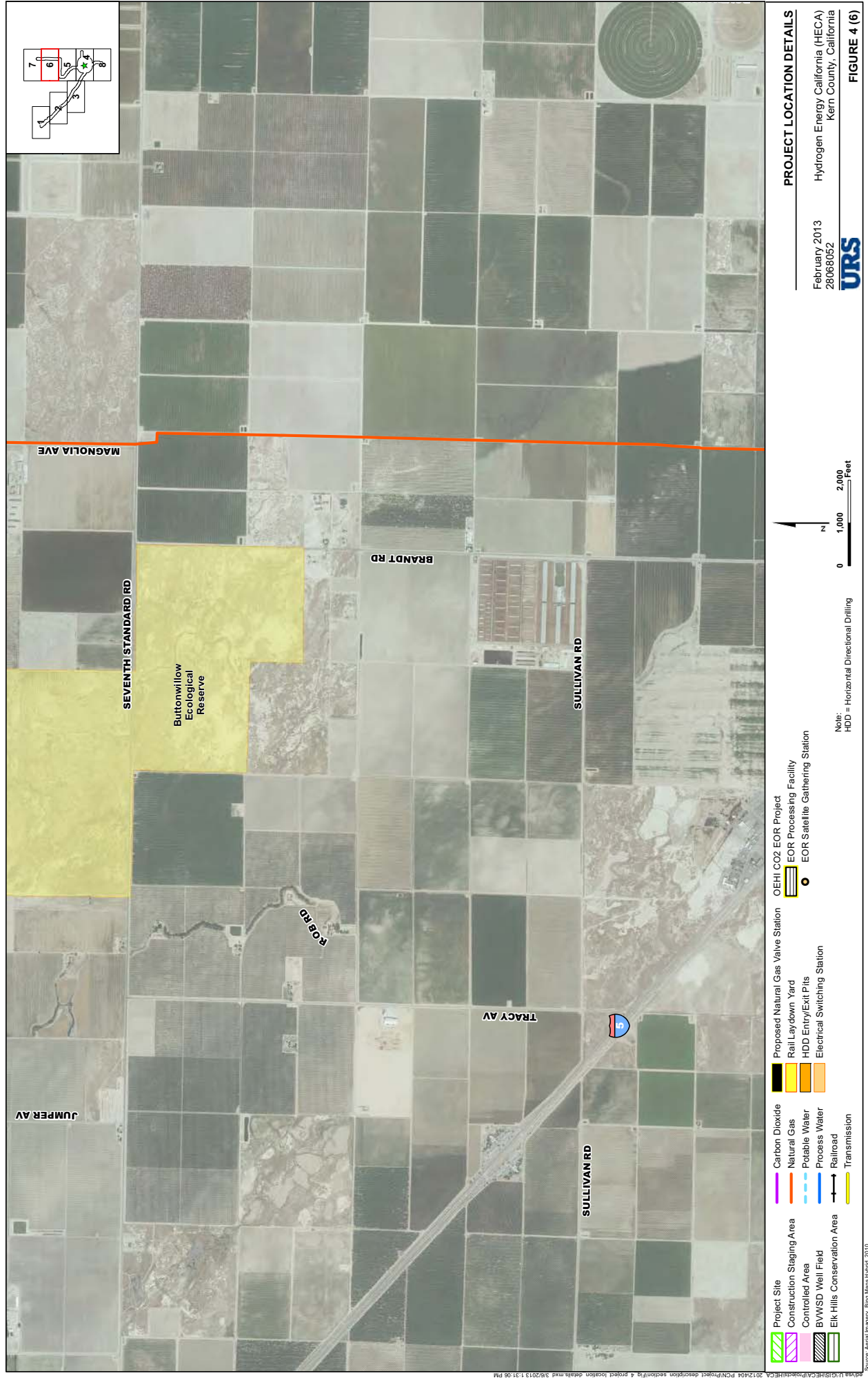


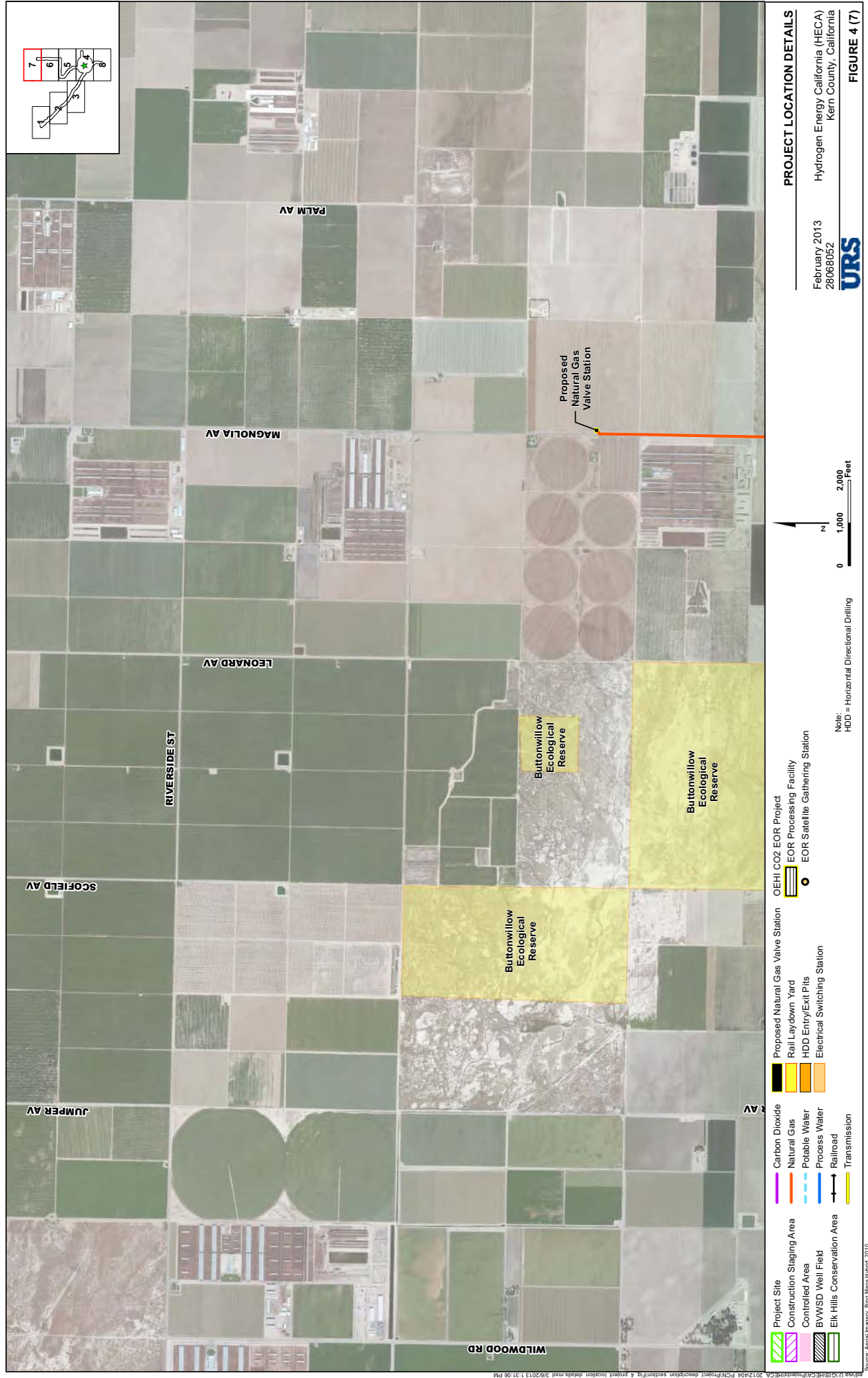


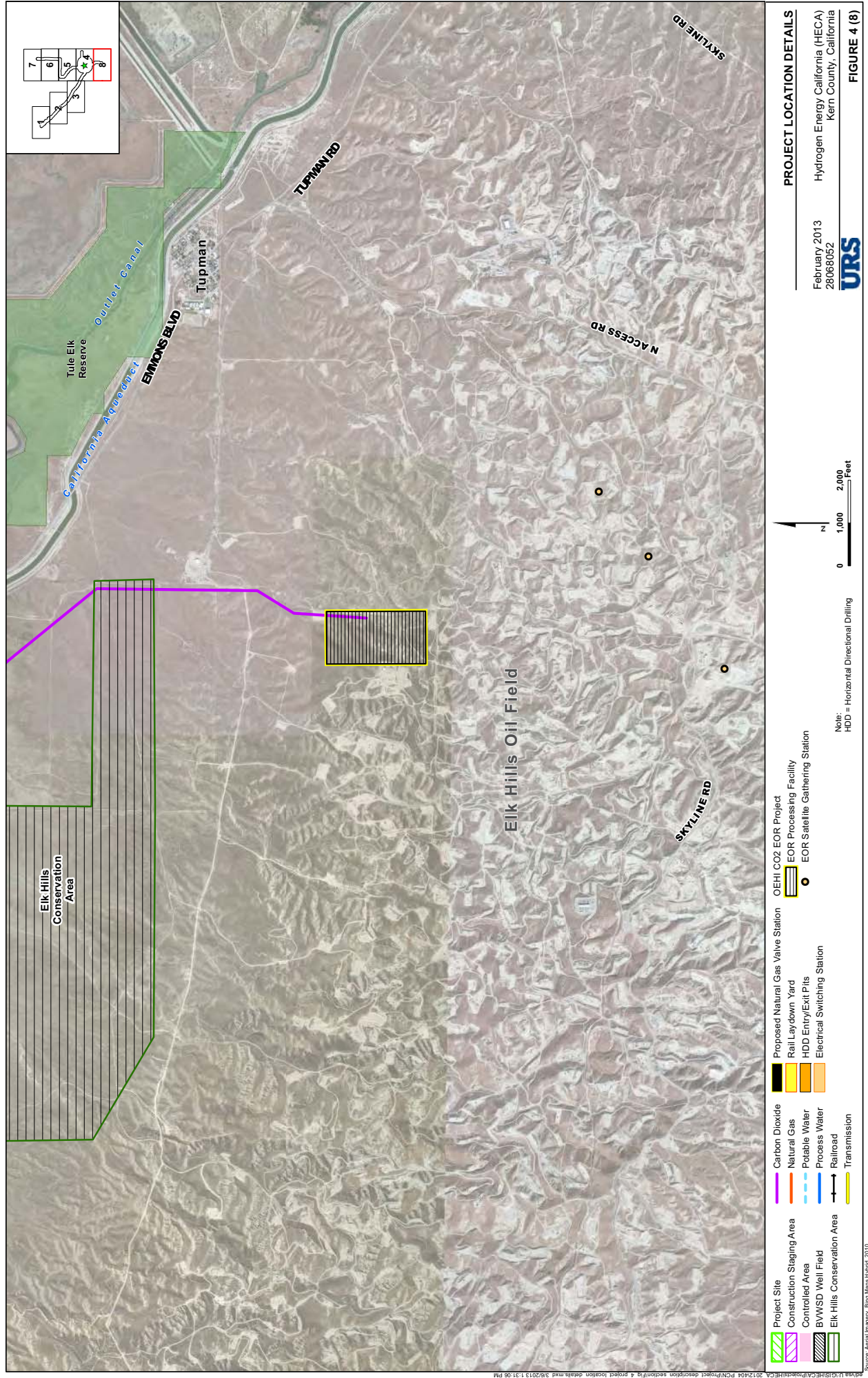












Appendix B Adjacent Landowner Information

Appendix B

Adjacent Landowner Information

Table B-1
Adjacent Landowner Information

APN	Name	Address	City	State	Zip
100-060-03	Chicca TR et al.	46336 Highway 58	Buttonwillow	CA	93206
100-190-07	Chicca Gino Trust	46336 Highway 58	Buttonwillow	CA	93206
100-190-08	Houchin Elmer and Shirley Family Trust	P.O. Box 55	Portola	CA	96122
100-190-09	Houchin Elmer and Shirley Family Trust	2485 Beech Street	Bakersfield	CA	93301
100-190-10	Houchin Elmer and Shirley Family Trust	2485 Beech Street	Bakersfield	CA	93301
100-190-14	Houchin Elmer and Shirley Family Trust	P.O. Box 55	Portola	CA	96122
100-190-17	Houchin Wallace H.	P.O. Box 98	Buttonwillow	CA	93206
100-200-17	Chicca Gino Trust	46336 Highway 58	Buttonwillow	CA	93206
100-200-19	Chicca Gino Trust	46336 Highway 58	Buttonwillow	CA	93206
100-200-20	State of California	801 K Street	Sacramento	CA	95814-3500
102-010-08	Houchin Wallace et al.	P.O. Box 98	Buttonwillow	CA	93206
102-010-10	Toy Margaret H. TRS	13302 Red Plum Street	Cerritos	CA	90703
102-010-14	Center For Natural Lands Management	215 West Ash Street	Fallbrook	CA	92028-2904
102-010-15	Center For Natural Lands Management	215 West Ash Street	Fallbrook	CA	92028-2904
102-010-29	Yard Dorothy T.	1115 Truxtun Avenue	Bakersfield	CA	93301
102-030-09	Biggs Edward Alan	1300 West Nickerson	Seattle	WA	98119
102-030-11	Biggs Edward Alan	1300 West Nickerson	Seattle	WA	98119
102-030-13	Cohen Madelyne C.	P.O. Box 2036	Murphys	CA	95247
102-030-15	Biggs Edward Alan	1300 West Nickerson	Seattle	WA	98119
102-040-03	Houchin Wallace et al.	P.O. Box 98	Buttonwillow	CA	93206
102-040-05	Houchin L.H. TR	4045 Stockdale Highway	Bakersfield	CA	93309

HYDROGEN ENERGY CALIFORNIA JURISDICTIONAL DELINEATION

**Table B-1
Adjacent Landowner Information (Continued)**

APN	Name	Address	City	State	Zip
102-040-06	Houchin Wallace et al.	P.O. Box 98	Buttonwillow	CA	93206
102-100-01	Ghilarducci Farms, Inc.	P.O. Box 654	Buttonwillow	CA	93206
102-100-02	Ghilarducci Farms, Inc.	P.O. Box 654	Buttonwillow	CA	93206
102-100-07	Willow Creek Ranch	5100 California Avenue	Bakersfield	CA	93309
102-100-08	Tazioli Robert and Susan Revocable Trust	7901 Calle Torcido	Bakersfield	CA	93309
102-100-09	Petrissans George and Marie Therese	15790 Twin Oaks Lane	Chino Hills	CA	91709-7853
102-100-10	South Central Farmers Health and Education Fun	1702 East 41st Street	Los Angeles	CA	90058
102-120-02	Willow Creek Ranch	5100 California Avenue	Bakersfield	CA	93309
102-120-05	Yoshimoto Zemman	4747 Knollcrest Court	Antioch	CA	94509
102-130-16	Pacific Gas and Electric Co.	P.O. Box 770000	San Francisco	CA	94177
102-130-18	Blank Dorothy B. et al.	106 Rose Lane	Belmont	CA	94002-3725
102-140-22	Welch John F.	1102 Santolina Drive	Novato	CA	94945-1840
102-140-24	Sherrell Brian Gene	7635 Jenica Road	Bakersfield	CA	93314
102-200-04	Petrissans George and Marie Therese	15790 Twin Oaks Lane	Chino Hills	CA	91709-7853
102-200-05	Franceschi Michael	8414 Ailanthus Court	Bakersfield	CA	93311
102-210-24	Stubbs Max B. and Roaslie	212 Goodman Street	Bakersfield	CA	93305-2904
102-210-26	De Gabain Colet M.	1740 Rosemary Lane	Redwood City	CA	94061-2617
102-210-28	Robison Marianne	2982 Villa Esta Drive	Atlanta	GA	30341-3710
102-210-30	Davis Melvin G. TR	P.O. Box 10926	Bakersfield	CA	93389
102-210-32	George Lloyd D.	208 Stonewood Court	Las Vegas	NV	89107-3250
102-210-34	Robison Marianne	2982 Villa Esta Drive	Atlanta	GA	30341-3710

Appendix B Adjacent Landowner Information

**Table B-1
Adjacent Landowner Information (Continued)**

APN	Name	Address	City	State	Zip
102-210-50	Bernal Elizabeth	P.O. Box 564	Boulder Creek	CA	95006
102-220-01	Petrissans George and Marie Therese	15790 Twin Oaks Lane	Chino Hills	CA	91709-7853
102-220-05	Riccomini Ricky E. and Melinda	11501 Buffington Street	Bakersfield	CA	93312
102-220-21	Franceschi Rita T. Trust	P.O. Box 194	Buttonwillow	CA	93206
102-220-23	Franceschi Rita T. Trust	P.O. Box 194	Buttonwillow	CA	93206
102-220-26	Ornelas Juanita	P.O. Box 208	Buttonwillow	CA	93206
102-230-05	Riccomini Ricky E. and Melinda	11501 Buffington Street	Bakersfield	CA	93312
103-060-05	Affentranger & Sons D. Farm, Inc.	18107 Kratzmeyer Road	Bakersfield	CA	93314-9481
103-190-10	Fanucchi Family L.P.	2913 Still Glen Street	Bakersfield	CA	93311-2515
103-190-14	Belluomini Ranches L.P.	P.O. Box 38	Buttonwillow	CA	93206
103-200-15	Buena Vista Water Storage Dist.	P.O. Box 756	Buttonwillow	CA	93206
103-200-23	Belluomini Ranches L.P.	P.O. Box 38	Buttonwillow	CA	93206
103-200-24	Snow Willis et al.	P.O. Box 275	Buttonwillow	CA	93206
103-200-25	Belluomini Ranches L.P.	P.O. Box 38	Buttonwillow	CA	93206
103-200-27	Belluomini Ranches L.P.	P.O. Box 38	Buttonwillow	CA	93206
103-200-28	Belluomini Ranches L.P.	P.O. Box 38	Buttonwillow	CA	93206
103-200-29	Belluomini Ranches L.P.	P.O. Box 38	Buttonwillow	CA	93206
103-240-01	Toretta Donald T. and Donna M. TR	P.O. Box 565	Buttonwillow	CA	93206
103-240-04	Romanini Family L.P.	8909 Versailles Drive	Bakersfield	CA	93311
103-260-29	Young Mary N. TR et al.	P.O. Box 695	Buttonwillow	CA	93206
158-020-02	Riccomini Ricky E. and Melinda	11501 Buffington Street	Bakersfield	CA	93312
158-020-03	Zargaryan Sevak	2000 Chilton Drive	Glendale	CA	91201

HYDROGEN ENERGY CALIFORNIA JURISDICTIONAL DELINEATION

**Table B-1
Adjacent Landowner Information (Continued)**

APN	Name	Address	City	State	Zip
158-020-11	Callon Petroleum Co.	P.O. Box 1287	Natchez	MI	39120
158-020-13	Shepherd Norman C.	396 West 3rd Street	Buttonwillow	CA	93206
158-020-14	Shepherd Norman C.	Route 1 Box 30	Buttonwillow	CA	93206
158-020-18	Shepherd Norman	396 West 3rd Street	Buttonwillow	CA	93206
158-020-25	Shepherd Norman	396 West 3rd Street	Buttonwillow	CA	93206
159-020-13	Petrissans Georges and Marie Therese Family TR	15790 Twin Oaks Lane	Chino Hills	CA	91709
159-040-02	Cauzza John B. III and Laura Kay	1600 Corn Camp Road	Buttonwillow	CA	93206
159-040-16	Kern Rice Processors, Inc.	1600 Corn Camp Road	Buttonwillow	CA	93206
159-040-18	Port Organic Products Ltd., Inc.	5060 California Avenue	Bakersfield	CA	93309-1682
159-050-08	Petrissans Georges and Marie Therese Family TR	15790 Twin Oaks Lane	Chino Hills	CA	91709
159-050-09	Petrissans George and Marie Therese	15790 Twin Oaks Lane	Chino Hills	CA	91709-7853
159-070-03	Dick Dykstra Dairies	10129 Schaefer	Ontario	CA	91761
159-070-08	Francis Erin Stuart	P.O. Box 2056	Kernville	CA	93238-2056
159-080-11	Franceschi Michael	8414 Ailanthus Court	Bakersfield	CA	93311
159-090-18	Tazioli James	396 Third Street	Buttonwillow	CA	93206
159-090-20	Tazioli James	12101 Stonington Street	Bakersfield	CA	93312-5795
159-100-08	Mills J.	346-D Avenue Sevilla	Laguna Hills	CA	92653
159-120-08	Heck Wendell and Bessie	5865 Adohr Road	Buttonwillow	CA	93206-9716
159-120-10	Douglas Ranches LLC	5100 California Avenue	Bakersfield	CA	93309
159-120-11	Douglas Ranches LLC	5100 California Avenue	Bakersfield	CA	93309
159-130-11	Dick Dykstra Dairies	10129 Schaefer	Ontario	CA	91761

Appendix B
Adjacent Landowner Information

Table B-1
Adjacent Landowner Information (Continued)

APN	Name	Address	City	State	Zip
159-190-06	Buena Vista Water Storage District	P.O. Box 756	Buttonwillow	CA	93206
159-300-02	McCallum Reta E.	54747 Benecia Trail	Yucca Valley	CA	92284
159-300-07	Hubbard Family Trust	273 Rockypoint Road	Palos Verdes	CA	90274
159-320-11	Methodist Chr-Soc. Calif. AZ Conf.	472 East Colorado Boulevard	Pasadena	CA	91109
086-320-11	Bloemhof Land & Farming	P.O. Box 747	Wasco	CA	93280
086-320-21	Bloemhof Land & Farming	P.O. Box 747	Wasco	CA	93280
086-330-12	Carey TR	2 Isabella Avenue	Atherton	CA	94025
099-010-07	Oblinger Carl G. Trust Est.	22776 Mesa Springs Way	Moreno Valley	CA	92557
099-020-06	Bloemhof Land & Farming	P.O. Box 747	Wasco	CA	93280
099-020-08	Oblinger Carl G. Trust Est.	22776 Mesa Springs Way	Moreno Valley	CA	92557
099-030-03	Bloemhof Land & Farming	P.O. Box 747	Wasco	CA	93280
099-030-12	Bloemhof Land & Farming	P.O. Box 747	Wasco	CA	93280
099-030-14	Bloemhof Land & Farming	P.O. Box 747	Wasco	CA	93280
099-040-02	Pachote Jim and Valerie	102 Lichen Court	Fremont	CA	94538-2422
099-040-03	Knaggs Albert F.	1386 East Lake Drive	Palm Springs	CA	92262
099-040-04	Miller Wylie R. and Carrie J.	798 Jordanna Road	Grand Junction	CO	81506
099-040-05	Hollinger Nell F. TR	1766 Flores Street	Seaside	CA	93955
099-040-08	Moore Living Trust	26515 Mazur Drive	Rnch Pls Vrds	CA	90275-2222
099-040-09	Alonso Angel	6423 South Oakes	Tacoma	WA	98409
099-040-10	Solinsky Jane L.	P.O. Box 262	Homewood	CA	96141
099-040-11	Miller Wylie R. and Carrie J.	798 Jordanna Road	Grand Junction	CO	81506
099-040-23	Strong Evelyn E.	879 Oxford Way	Benicia	CA	94510

HYDROGEN ENERGY CALIFORNIA JURISDICTIONAL DELINEATION

**Table B-1
Adjacent Landowner Information (Continued)**

APN	Name	Address	City	State	Zip
099-050-21	Kelly Graham M. Fmly. Surv. TR	422 D Avenue	Coronado	CA	92118
099-081-02	Hawk Brook A.	233 Ironwood Street	Vacaville	CA	95688-2732
099-081-03	Richard Jeff L.	2247 Southwest Pumice Avenue	Redmond	OR	97756
099-081-25	Sciaromi Brian L.	1206 West Stuart Avenue	Fresno	CA	93711
099-081-27	French R.R.	P.O. Box 482	Kings Beach	CA	96143
099-081-28	Arredondo Lynnette Gutierrez	P.O. Box 931	Chino	CA	91708
099-210-01	Chicca TR et al.	46336 Highway 58	Buttonwillow	CA	93206
099-210-04	Oblinger Carl G. Trust Est.	22776 Mesa Springs Way	Moreno Valley	CA	92557
099-210-05	Oblinger Carl G. Trust Est.	22776 Mesa Springs Way	Moreno Valley	CA	92557
099-210-06	Oblinger Carl G. Trust Est.	22776 Mesa Springs Way	Moreno Valley	CA	92557-2627
099-220-06	Burdick John K.	13705 Foxhills Drive	Novelty	OH	44072
100-060-07	Chicca TR et al.	46336 Highway 58	Buttonwillow	CA	93206
100-060-08	Chicca TR et al.	46336 Highway 58	Buttonwillow	CA	93206

**Appendix C Preliminary Jurisdictional Delineation
(provided separately)**

Appendix D Horizontal Directional Drilling Plan

HYDROGEN ENERGY CALIFORNIA KERN COUNTY, CALIFORNIA

DRAFT HORIZONTAL DIRECTIONAL DRILLING PLAN HYDROGEN ENERGY CALIFORNIA CARBON DIOXIDE PIPELINE

Prepared for:

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Contact: Marisa Mascaro
(978) 287-9529

Prepared by:

URS Corporation
Post Montgomery Center
One Montgomery Street, Suite 900
San Francisco, CA 94104-4538
Contact: Dale Shileikis
(415) 896-5858

URS Project Number 28068052

April 2013

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HYDROGEN ENERGY CALIFORNIA DRAFT HORIZONTAL DIRECTIONAL DRILLING PLAN

Figures

- Figure 1 CO₂ Supply Line Alignment
Figure 2 Typical HDD Crossing

Acronyms and Abbreviations

API	American Petroleum Institute
CO ₂	carbon dioxide
EHOF	Elk Hills Oil Field
HDD	horizontal directional drilling
HECA	Hydrogen Energy California
KRFCC	Kern River Flood Control Channel
OEHI	Occidental of Elk Hills, Inc.
Project Site	The physical location or site where the power generating facility and associated structures or components would be built.
Project	Hydrogen Energy California LLC Integrated Gasification Combined-Cycle polygeneration project
SWPPP	Storm Water Pollution Prevention Plan

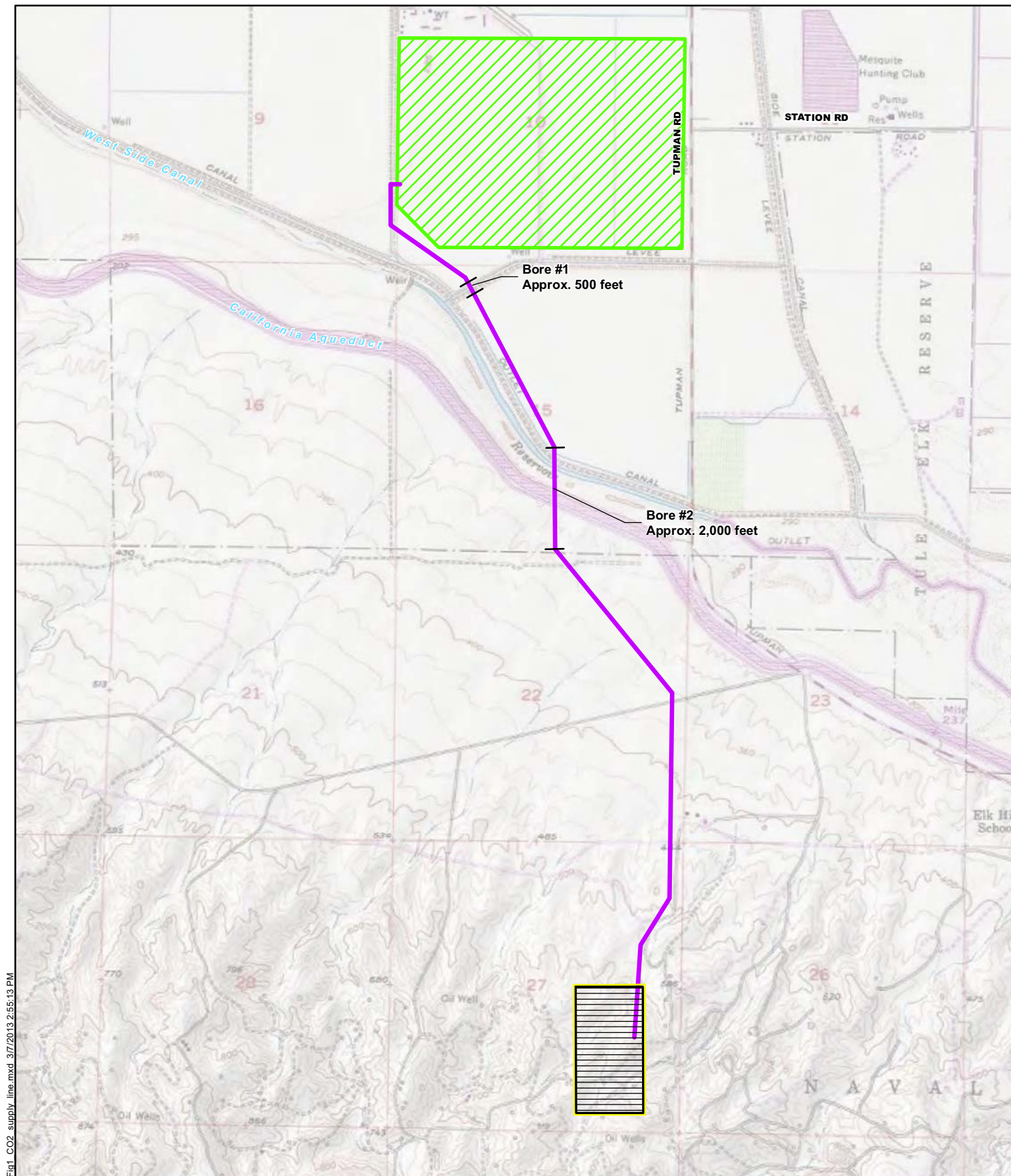
1.0 INTRODUCTION




Carbon dioxide (CO₂) from the Hydrogen Energy California (HECA) Project will be compressed and conveyed via pipeline to the Elk Hills Oil Field (EHOF), where it will be injected for enhanced oil recovery. Occidental of Elk Hills, Inc. (OEHI) will install the CO₂ pipeline from the HECA Project site to the EHOF. The CO₂ supply line alignment is shown on Figure 1, and is approximately 3.4 miles long.

Horizontal directional drilling (HDD) will be used to install the CO₂ pipeline underground in two locations. One HDD crossing will be approximately 500 feet in length under the Westside Canal; and the second HDD crossing will be approximately 2,000 feet in length under the Outlet Canal, Kern River Flood Control Channel (KRFCC), and the California Aqueduct (Figure 2). The remainder of the CO₂ supply line will be installed using conventional trenching techniques.

The work described in this Draft HDD Plan consists of furnishing and installing underground utilities using the HDD method of installation, also commonly referred to as directional boring, or guided horizontal boring. This work will include all services, equipment, materials, and labor for the complete and proper installation, testing, and restoration of underground utilities, and environmental protection and restoration. HECA will comply with and obtain the necessary encroachment permits from the Department of Water Resources, and any other appropriate agencies. HDD technology, which has been in use since about 1970, is a blending of aspects of conventional boring and directional drilling in oil/gas wells. It is now used routinely for the installation of various utility lines across barriers such as rivers and other water bodies, highways, railroads, congested areas, and airport runways. The utility installations have included pipelines for oil, natural gas, and other fluids; as well as ducts or conduits for electrical and fiber optic cables. Pipelines with diameters up to 60 inches have been installed using HDD technology. The length and size of the pipe installed depends on site-specific soil conditions, as well as current technology and equipment.

It is recognized that risks associated with HDD activities include the inadvertent release of drilling fluids to the surface due to excessive drilling pressure (also known as a “frac-out”); soil heaving/settlement from drilling; water disposal from dewatering; erosion from work at entrance/exit pits; and damage/injury from inadvertently boring through existing utilities. This plan identifies and describes the measures to be implemented to minimize these risks.



-  Project Site
-  EOR Processing Facility
-  Carbon Dioxide Linear

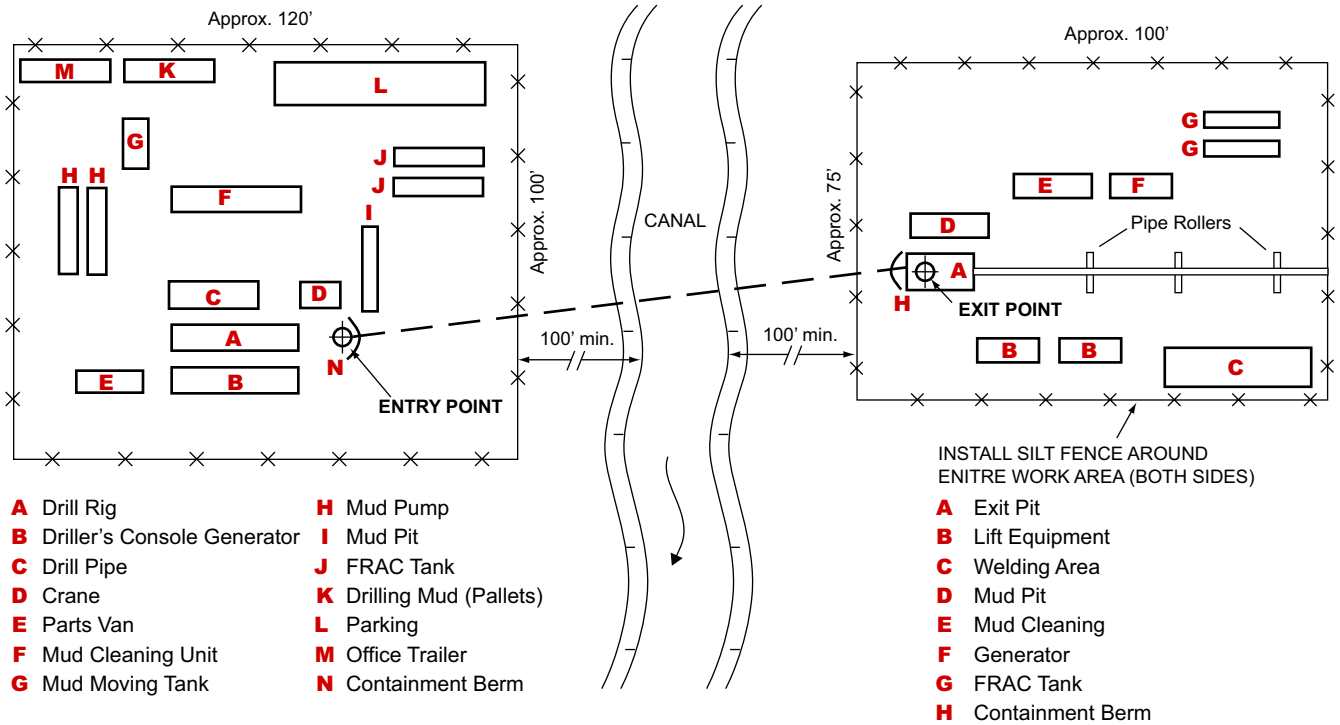
CO2 SUPPLY LINE ALIGNMENT

April 2013
28068052

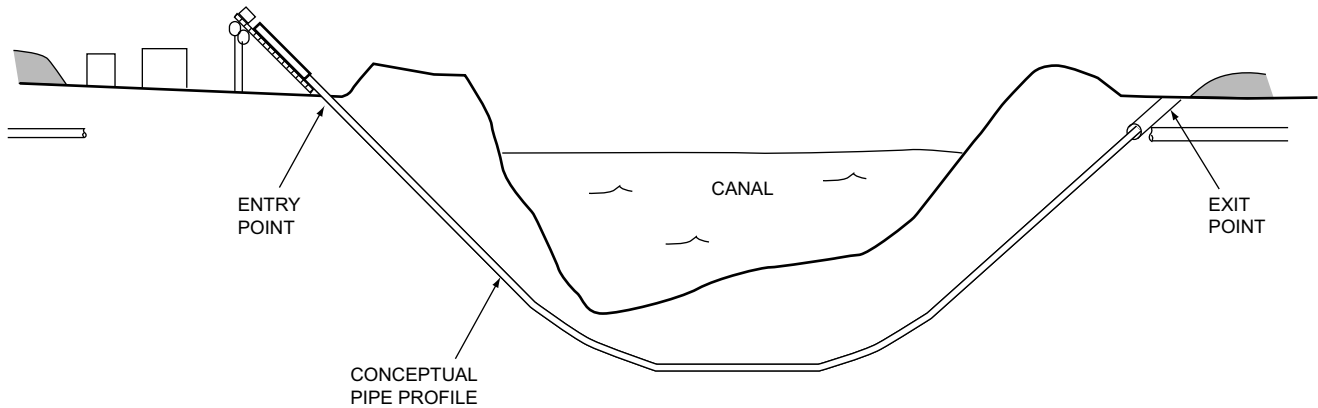
Hydrogen Energy California (HECA)
Kern County, California



FIGURE 1



PLAN



PROFILE

NOTES:

1. Drilling equipment will be set back a minimum of 100 feet from the edge of the canal. No clearing or grading will occur within the 100-foot zone.
2. Only bentonite based drilling mud will be used. The use of any additives to the drilling mud will not occur without the approval of HECA's representative.
3. Suitable drilling mud tanks or sumps will be installed to prevent contamination of the canal.
4. Berms will be installed downslope from the drill entry and anticipated exit points to contain any release of drilling mud.
5. Drilling mud will be disposed of in accordance with the appropriate regulatory agency requirements.

Schematic only; not to scale

TYPICAL HDD CROSSING

April 2013
28068052

Hydrogen Energy California (HECA)
Kern County, California

URS

FIGURE 2

2.0 GENERAL DESCRIPTION OF WORK

2.1 MAJOR EQUIPMENT

Specific equipment, drilling fluids, and additives to be used in construction of the planned HDD crossings will be supplied prior to work initiation in the form of HDD specifications. Equipment will include, but not be limited to, drilling rig, mud system, mud motors (if applicable), downhole tools, guidance system, and rig safety systems. Calibration records for guidance equipment will also be provided. The directional drilling equipment will consist of a directional drilling rig of sufficient capacity to perform the bore and pull back the pipe; a drilling-fluid mixing system; delivery and recovery system of sufficient capacity to successfully complete the crossing; a drilling-fluid recycling system to remove solids from the drilling fluid so that the fluid can be reused; a guidance system to accurately guide boring operations; a vacuum truck of sufficient capacity to handle the drilling-fluid volume; and trained and competent personnel to operate the system. All equipment will be in good, safe operating condition, with sufficient supplies, materials, and spare parts on hand to maintain the equipment in good working order for the duration of the Project.

2.1.1 Drilling System

Drilling Rig

The directional drilling rig will consist of a hydraulically powered system to rotate, push, and pull hollow drill pipe into the ground at a variable angle, while delivering a pressurized fluid mixture to a guidable drill (bore) head. The drill head can be steered by changing its rotation, and will provide the necessary cutting surfaces and drilling-fluid jets. The rig will be adequately anchored to the ground to withstand the pulling, pushing, and rotating pressure required to complete the crossing, including pullback operations. The hydraulic power system will be self-contained, with sufficient pressure and volume to power drilling operations. The hydraulic system will be free of leaks. The drilling rig will have a system to monitor and record maximum pullback pressure during pullback operations. The rig will be grounded during drilling and pullback operations.

Mud Motors (if Required)

Mud motors are positive displacement pumps that are designed to be installed in the drill string, to provide additional power to the drill bit while drilling (if needed). The drilling mud flows through the mud motor, and the pump provides a boost to the drill bit's power. Any mud motor used will be of adequate power to turn the required drilling tools.

Drill Pipe

Drill pipe will consist of high-tensile-strength carbon-steel tubing fitted with threaded end-connections to allow continued extension of the boring apparatus. The specific pipe size, wall thickness, and material makeup will be selected based on the final HDD design.

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2.1.2 Guidance System

A Magnetic Guidance System or a proven gyroscopic system will be used to provide a continuous and accurate determination of the location of the drill head during the drilling operation. The guidance will be capable of tracking at all depths up to 100 feet below the surface; and in any soil condition, including hard rock. The guidance system will enable the driller to guide the drill head by providing immediate information on the tool face, azimuth (horizontal direction), and inclination (vertical direction).

The guidance system will be of a proven type and will be operated by personnel trained and experienced with this system. The operator will be aware of any magnetic anomalies on the surface of the drill path, and will consider such influences in the operation of the guidance system, if using a magnetic system.

2.1.3 Drilling Fluid (Mud) System

Mixing System

A self-contained, closed drilling-fluid mixing system will be of sufficient size to mix and deliver drilling fluid. The mixing system will continuously agitate the drilling fluid during drilling operations.

Mud Delivery System

The mud-pumping system will have sufficient capacity and be capable of delivering the drilling fluid at a constant minimum pressure. The capacity and pressure will be defined in the HDD specifications. The delivery system will have filters in-line to prevent solids from being pumped into the drill pipe. Proper connections between the pump and drill pipe will minimize leaks. Used drilling fluid and drilling fluid spilled during drilling operations will be contained, and conveyed to the drilling-fluid recycling system. All leaks will be documented and reported immediately to the environmental monitor for appropriate handling.

Drilling-Fluid Recycling System

The drilling-fluid recycling system will separate sand, dirt, and other solids from the drilling fluid to render the drilling fluid reusable.

2.1.4 Other Equipment

Pipe Rollers

Pipe rollers will be of sufficient size to fully support the weight of the installed pipe while being hydrotested, and during pullback operations. A sufficient number of rollers will be used to prevent excess sagging of pipe.

Pipe Rammers (if required)

Hydraulic or pneumatic pipe rammers may be used, if necessary, to help free stuck pipe, overcome hydrolock, or reduce stress levels during pullback operations. Rams may also be used to install a casing at the drill entry to provide a cleaner bore start.

Pipe

The 12-inch-diameter CO₂ pipeline will be steel pipe that meets American Petroleum Institute (API) specifications for welded and seamless steel pipe used to convey gas, water and oil (such as API 5L, PS L2). This pipeline is expected to have a maximum operating pressure of less than 3,000 pounds per square inch. Additional piping specifications will be determined during detailed engineering design. Pipe for the HDD will be welded together in one length, if space permits, with welds X-rayed prior to being placed in the borehole. As necessary, the HDD will be accomplished with two courses. Pipe will be placed on pipe rollers before pulling into the borehole, with rollers spaced close enough to prevent excessive sagging of pipe.

2.2 HDD OPERATION AND PROCEDURES

2.2.1 Site Preparation

Prior to the start of ground-disturbing activities, work sites and the construction right-of-way will be identified on drawings. Work sites will be graded to provide a level working area. No ground disturbance or alterations are to be made, beyond what is required for HDD operations or other pipeline activity. All activities will be confined to the designated work areas.

2.2.2 Utility Locating

To avoid existing utilities, a “one call” utility location service will be used prior to identifying the drill path. If, after initiating the “one call” process, there are known facilities in the area that have not been marked, the owner/operator of the facilities will be contacted to mark their facility. The drill path will be modified, as needed, to prevent damage to existing facilities.

2.2.3 Pilot Hole Drilling Procedure

The pilot hole will be drilled on the bore path with no deviations greater than 5 percent of depth over a length of 100 feet, unless defined otherwise in the HDD specifications or plan. In the event that the pilot does deviate from the bore path by more than 5 percent of depth in 100 feet, the specific conditions will be evaluated; and, if warranted, the bore will be pulled back and redrilled from a point before the deviation. If a drilling-fluid fracture, inadvertent returns, or returns loss occurs during pilot hole drilling operations, drilling will be halted until the fracture can be sealed using higher-viscosity drilling fluid. The process for sealing such fractures will be to wait at least 30 minutes after stopping the drill; inject a fluid with a higher viscosity, and then wait another 30 minutes before continuing with the operation.

If the mud fracture or return loss continues, operations will again be halted while the problem is evaluated. Depending on the specific conditions, additional attempts to seal the fracture will be

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made. As a last resort, the bore will be abandoned in accordance with Section 7.0 of this Draft HDD Plan.

2.2.4 Reaming

On successful completion of the pilot hole, boreholes will be reamed, using the appropriate tools, to a minimum diameter of 25 percent greater than the outside diameter of pipe to be installed. The amount of reaming at one time will be limited to no more than the capacity of the drilling equipment and mud system.

2.2.5 Pullback

After successfully reaming the borehole to the required diameter, the pipe will be pulled through the borehole. In front of the pipe will be a swivel and reamer to compact the borehole walls. Once they have commenced, pullback operations must continue without interruption until the pipe is completely pulled into borehole. During pullback operations, the pull pressure will be less than or equal to the maximum safe limit, as defined in the HDD specifications or plan. If pull progress stops, pulling operations will be halted to allow any potential hydrolock to subside before continuing. If progress remains impeded, operations will again be halted while the problem is evaluated. Depending on the specific conditions, additional attempts to allow the hydrolock to subside will be made. As a last resort, the bore will be abandoned, in accordance with Section 7.0 of this Draft HDD Plan.

2.2.6 Hydrostatic Testing

The source of water for the hydrostatic testing will be potable water from West Kern Water District.

Following successful pullback of the pipe, the installed pipe will be strength-tested using pressurized water for a period of 8 hours. All testing will be performed in accordance with U.S. Department of Transportation regulations outlined in 49 Code of Federal Regulations Part 195/American Society of Mechanical Engineers B31.4 (CO₂ pipeline), as appropriate. A calibrated pressure recorder will be used to record the pressure during the test period.

2.2.7 Dewatering Procedures

If the duration of the discharge of the hydrostatic test water is more than a few weeks, then HECA will acquire the necessary approvals to comply with the State Water Resources Control Board's Water Quality Order No. 2003-0003-DWQ, which includes low-threat discharges to land from hydrostatic testing. Alternatively, the hydrostatic test water could be discharged to one of the local canals, in accordance with the Central Valley Regional Water Quality Control Board's General Order No. R5-2008-081, which includes low-threat discharges to surface water from hydrostatic testing.

On successful completion of the hydrotest, the test water will be discharged through appropriate filters and energy-dissipating devices, if needed, in compliance with the appropriate permit requirements.

2.3 STORM WATER POLLUTION PREVENTION PLAN

A Storm Water Pollution Prevention Plan (SWPPP) will be prepared in accordance with the requirements of the General Permit for Discharges of Storm Water Associated with Construction Activity Order 2009-0009-DWQ, and as amended by Order 2010-0014-DWQ. The HDD will comply with the requirements of the General Permit for Discharges of Storm Water Associated with Construction Activity, as appropriate.

There are no water bodies in the vicinity of the Project that are listed on the 303(d) list for sediment; therefore, a sediment monitoring plan would not be required. The SWPPP will be available on site during all construction and restoration phases of the Project.

During construction, the measures described in the SWPPP will be implemented to prevent erosion and to salvage topsoil and seed banks.

2.4 SITE RESTORATION

Following drilling operations, equipment will be demobilized, and the work-site will be returned to preconstruction conditions, in accordance with Project and regulatory requirements. All excavations will be backfilled, compacted, and revegetated with native seed.

3.0 PROPOSED PIPE ALIGNMENT

The crossings for the 12-inch CO₂ pipeline are shown on Figure 1. The pipeline runs predominantly north to south from the HECA Project Site, and crosses the West Side Canal, the Outlet Canal, the KRFCC, and the California Aqueduct.

3.1 CROSSING OF WEST SIDE CANAL

The first HDD crossing will be approximately 500 feet in length, and will cross under the West Side Canal. The depth of this crossing will be approximately 50 to 100 feet below grade.

3.2 CROSSING OF OUTLET CANAL, KRFCC, AND CALIFORNIA AQUEDUCT

The second HDD crossing will be approximately 2,000 feet in length, and will cross under the outlet canal, the KRFCC, and the California Aqueduct. The profile of the drill is such that the estimated maximum depth of this crossing under the bottom of the California Aqueduct will be approximately 50 to 100 feet below grade.

3.3 TYPICAL LAYOUT

A typical work site for HDD crossings is shown on Figure 2. Each HDD site will have an HDD entry excavation (120 feet by 100 feet) and an HDD exit excavation (75 feet by 100 feet) (Stantec, 2012). The specific details and layout for each of the Project HDD sites will be determined by the final design for construction.

4.0 MONITORING PROCEDURES

4.1 PILOT HOLE, REAMING, AND PULLBACK

The bore will be covered with a TruTracker® coil that will enable verification of the hole location at every survey point under the coil. If at any point the coil shows the alignment to be unacceptable, the drill pipe will be pulled back to an acceptable point to redirect the hole. Grout will be pumped into the abandoned section of the hole; after allowing the grout to set, the hole will be redirected to stay within acceptable limits. This system requires above-ground equipment along the intended path of the bore. Appropriate notifications and permitting documents will be addressed on final design.

4.2 UNINTENDED FRAC-OUT

Fluid recovery will be monitored on a continuous, or near-continuous basis. Plugging of the borehole annulus or the presence of a major formation fracture will typically lead to partial or full loss of drilling-fluid circulation. Fluid loss will be monitored by watching for significant differences between the fluid rate being pumped downhole, and the rate of returns flowing into the surface containment pits. The drill pipe will be monitored for the presence of backpressure when unscrewing from the downhole work string, because this is an indicator of a plugged annulus, which could lead to a frac-out. The drilling-fluid pump rate and solids control-tank level will also be monitored. If fluid circulation becomes slowed, or if back-pressure in the string is present, the following procedure will be implemented:

1. Temporarily cease drilling operations and shut off the mud pumps.
2. Dispatch observers, as required, to monitor the area along the bore alignment.
3. If no drilling fluids are seen on the ground surface, start mud pumps, and gradually increase volumes as the drill pipe is pulled back, to wipe the borehole annulus and encourage flow.

It should be noted that drill cuttings generated as a result of the drilling process will often naturally bridge and subsequently seal fractures or voids in the formation as drilling progresses, thus providing another means to reestablish lost circulation. This is particularly likely during the reaming process, as higher volumes of cuttings are being generated.

4.3 GROUND-SURFACE MOVEMENT (SETTLEMENT OR HEAVE)

Surveying and visual monitoring will be performed during drilling operations to determine current conditions, determine the integrity of the element being crossed, and verify that no damage has occurred. Survey points will be installed along the intended route in the vicinity of the HDD to facilitate monitoring periodically during drilling.

If excessive ground-surface settlement is observed, drilling operations would be stopped immediately and appropriate notifications would be made, as described in Section 8.0 of this Draft HDD Plan. After notification, all affected personnel would make a determination of the appropriate action to be taken. Any action would only be taken after approval.

5.0 CONTAINMENT AND CONTROL

5.1 DRILLING FLUIDS

Drilling fluid will be composed of clean water and appropriate clay additives, and will be fully outlined in the HDD specifications. No material will be used in drilling fluid that is considered hazardous, or may pose a threat to the aquatic system and/or wildlife.

5.2 DRILLING FLUIDS DELIVERY, RECOVERY, AND CONTAINMENT

5.2.1 Delivery

The mud-pumping system will have sufficient capacity and be capable of delivering the drilling fluid at a constant minimum pressure. Filters will be in place to keep solids from being pumped into the drill pipe.

5.2.2 Recovery

Drilling mud is circulated through the drill pipe and returned to the settlement pit in the entry pit site. Used drilling fluids and any drilling fluids spilled during the drilling operation will be contained and returned to the drilling fluid recovery system.

5.2.3 Containment

A berm of sufficient height will be maintained around drill rigs, the drilling-fluid mixing system, entry and exit points, and the drilling-fluid recycling system to prevent spills into the surrounding environment. Pumps and or vacuum truck(s) of sufficient size will be in place to convey excess drilling fluid from containment areas to storage and recycling facilities.

To prevent migration from the fracture location, drilling fluid will be contained with sand or gravel bags, straw bales, and/or wattles; or a pre-made containment vessel made of steel.

Where possible and if needed, a small sump pit will be excavated at any fracture location to provide a means for the fluid to be returned to either the drilling site for cleaning and reuse, or to an approved dump site (i.e., vacuum trucks, pumps, or both).

Containment, response, and cleanup equipment will be available at both sides of the HDD crossing location. This equipment will include, but will not necessarily be limited to, the following:

- straw bales
- silt fencing
- plastic sheeting
- mud pumps and hose
- mud storage tanks
- vacuum truck.

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5.3 METHOD/LOCATION FOR DISPOSAL WASTE

OEHI will identify a suitable and approved disposal site for the spent drilling fluids and other waste materials. Drilling waste will consist primarily of drilling cuttings and used mud. The used drilling mud and the drilling cuttings will be collected in an earthen pit next to the drilling rig. Drilling cuttings and used mud will be sampled and characterized; if they are determined to be nonhazardous, they will be transported by truck to an authorized disposal site after the drilling operations are completed. There are no hazardous chemicals in the proposed drilling mud.

6.0 HAZARDOUS MATERIALS CONTINGENCY PLAN

OEHI will comply with the applicable terms and conditions from all federal, state, and county regulatory agencies regarding environmental protection. Prior to implementing the HDD activities, a Hazardous Materials Contingency Plan will be developed to specify the regulatory framework that would govern unplanned encounters with hazardous materials, such as the discovery of previously contaminated soil, striking an existing subsurface pipeline that was not detected during pre-work planning, or utility location.

The Hazardous Materials Contingency Plan will also describe the measures to be implemented to prevent the unplanned release of hazardous materials (i.e., fuel and hydraulic fluid for vehicles and construction equipment) during the HDD activities. These terms and conditions include, but are not limited to, the following measures:

- Silt fencing will be placed between all drilling operations and any drainage, wetland, waterway, or other area designated for such protection by contract documents, or state, federal, and local regulations. Additional environmental protection necessary to contain any hydraulic fluid spills will be put in place, including berms, liners, turbidity curtains, and other measures. Any work within 100 feet of waters of the United States, and/or within 15 feet of nonjurisdictional waters, will incorporate best management practices to minimize fill and/or degradation of waters. Refueling of construction equipment and storage of fuel or other hazardous chemicals would not occur within 50 feet of any jurisdictional waters, or within 15 feet of nonjurisdictional waters.
- Environmental Monitors (as defined below) will be identified for the Project during construction and restoration. The number and experience of Environmental Monitors assigned to the Project will be appropriate for the number/significance of resources affected. Environmental Monitors will have the authority to stop activities that violate the environmental conditions of county, state, and federal environmental permit conditions, or landowner requirements, and to order appropriate corrective action.

7.0 ABANDONMENT PLAN

Although every precaution will be taken during design, construction preparation, and drilling operations, conditions may arise that could require the planned path to be redirected or abandoned. This would include a utility strike, extremely hard rock, or excessive deviation from the intended drill path.

If an obstruction that stops progress is encountered, drilling will be suspended until the likely nature of the obstruction can be determined. This determination will be made taking into consideration the plotted locations of the bit, the presence (or lack of) magnetic interference as monitored by the steering tool, and analysis of mud returns (for wood, etc.). If it is determined that the obstruction is something that can and should be drilled through, a different assembly could be used, such as a mud motor. If it is determined that the obstruction is something that cannot or should not be drilled through, an alternative drill path design will be developed, and submitted to OEHI for approval. The drill bit will be retracted to a point that would allow the necessary deviation, and drilling would resume on the new course.

8.0 NOTIFICATION PROCEDURE

Conditions encountered that necessitate deviation from this plan may require agency notification. HDD specifications will include a notification matrix and specific sequence of notifications to be completed, from the construction crews through appropriate agencies, considering the final HDD designs. All of the following would be notified immediately:

- Project site inspector(s)
- Project representative(s)
- Representative(s) from Kern County, as appropriate
- Representative(s) from Department of Water Resources, as appropriate
- Representative(s) from California Department of Fish and Wildlife, as appropriate
- Representative(s) from Regional Water Quality Control Board, as appropriate
- Representative(s) from U.S. Army Corps of Engineers, as appropriate
- Representative(s) from Central Valley Flood Protection Board, as appropriate
- State Fire Marshal.

9.0 REFERENCES

Stantec. 2012. *Modified CO₂ Supply Line Alignment Data Gap Analysis*. April.

**Appendix E Biological Assessment
(provided separately)**

ATTACHMENT A54-2
CDFW INCIDENTAL TAKE PERMIT APPLICATION



May 2, 2013

Julie Vance
Environmental Program Manager
Habitat Conservation Planning
California Department of Fish and Wildlife
Central Region (R4)
1234 E. Shaw Avenue
Fresno, CA 93710

Re: Hydrogen Energy California LLC (HECA) – Application for Incidental Take Permit

Dear Ms. Vance:

Hydrogen Energy California, LLC (HECA) proposes to construct an integrated gasification combined-cycle polygeneration project in western Kern County, California. The enclosed Incidental Take Permit (ITP) application is submitted for CDFW review on behalf of HECA LLC. The California Energy Commission (CEC) is currently reviewing the HECA Project for certification, and it is our understanding that CDFW will coordinate its review with the CEC and that action on the ITP application will be integrated into the CEC certification. Consistent with that process, HECA is requesting CDFW review of the enclosed application. The enclosed ITP application addresses actions proposed by HECA as well as the related actions proposed for the Occidental of Elk Hills, Inc. (OEHI). A detailed description of the proposed actions and the potential effects of these actions on State-listed species are provided in the enclosed document.

The Department of Energy (DOE) is the federal lead agency for the HECA Project and has initiated consultation with the U.S. Fish and Wildlife Service under Section 7(a)(2) of the ESA for the actions addressed in this ITP application.

We look forward to working with you towards the successful completion of this process. Please contact Steve Leach at (510) 874-3205 or Jan Novak at (510) 874-1733 regarding the enclosed document.

Sincerely,

URS Corporation

A handwritten signature in blue ink, appearing to read "Dale Shileikis", is located below the "URS Corporation" text.

Dale Shileikis
Project Manager
URS Corporation

URS Corporation
One Montgomery Street, Suite 900
San Francisco, CA 94104
Tel: 415.896.5858
Fax: 415.882.9261

Enclosure:
Incidental Take Permit Application (2 copies)

cc: Marisa Mascaro, HECA

HYDROGEN ENERGY CALIFORNIA KERN COUNTY, CALIFORNIA

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE INCIDENTAL TAKE PERMIT APPLICATION

Prepared for:

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URS Project Number 28068052

May 2013

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HYDROGEN ENERGY CALIFORNIA INCIDENTAL TAKE PERMIT APPLICATION

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List of Acronyms

AFC	Application for Certification
BRMIMP	Biological Resource Mitigation Implementation and Monitoring Plan
BVWSD	Buena Vista Water Storage District
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CESA	California Endangered Species Act
CNPS	California Native Plant Society
CO ₂	carbon dioxide
EHOF	Elk Hills Oil Field
EOR	enhanced oil recovery
HCP	Habitat Conservation Plan
HDD	Horizontal directional drilling
HECA	Hydrogen Energy California
ITP	Incidental Take Permit
KRFCC	Kern River Flood Control Channel
MOU	Memorandum of Understanding
OEHI	Occidental of Elk Hills, Incorporated
petcoke	petroleum coke
PG&E	Pacific Gas and Electric Company
Project	HECA Power Generating Facility
ROW	Right-of-way
SR	State Route
syngas	synthetic gas
URS	URS Corporation
USFWS	U.S. Fish and Wildlife Service
WKWD	West Kern Water District

EXECUTIVE SUMMARY

Hydrogen Energy California LLC (HECA LLC) is proposing an Integrated Gasification Combined Cycle polygeneration project (hereafter referred to as HECA or the Project) in Kern County, California. HECA LLC is owned by SCS Energy California LLC. The HECA Project will gasify a 75 percent coal and 25 percent petroleum coke (petcoke) fuel blend to produce synthesis gas (syngas). Syngas produced via gasification will be purified to hydrogen-rich fuel, which will be used to generate low-carbon baseload electricity in a Combined-Cycle Power Block; low-carbon nitrogen-based fertilizer in an integrated Manufacturing Complex; and carbon dioxide (CO₂) for use in enhanced oil recovery (EOR).

The fertilizer and power produced by the HECA Project have a low-carbon footprint, because more than 90 percent of the CO₂ in the syngas is captured, and approximately 3 million tons per year of CO₂ will be transported via pipeline for use in EOR, which results in simultaneous sequestration (storage) of the CO₂ in a secure geologic formation (HECA, 2012). CO₂ will be transported for use in EOR in the adjacent Elk Hills Oil Field, which is owned and operated by Occidental of Elk Hills, Inc. (OEHI) (hereafter referred to as the OEHI Project).

The U.S. Department of Energy is providing financial assistance to the HECA Project under the Clean Coal Power Initiative Round 3 via a cost-sharing agreement with HECA LLC.

This Incidental Take Permit (ITP) application identifies potential adverse effects to species listed under the California Endangered Species Act (CESA) for both the HECA Project and the OEHI Project. Without implementation of proposed avoidance, minimization, and mitigation measures, the construction, operation, maintenance, and decommissioning over the life of the HECA Project and OEHI Project may cause take of the following California listed species:

- Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) – State Endangered
- Giant kangaroo rat (*Dipodomys ingens*) – State Endangered
- Nelson's antelope squirrel (*Ammospermophilus nelsoni*) – State Threatened
- San Joaquin kit fox (*Vulpes macrotis mutica*) – State Threatened
- Swainson's hawk (*Buteo swainsoni*) – State Threatened

Conservation measures are proposed in this Application that will avoid, minimize, or compensate for the potential of the affected state-listed species. These measures will include preconstruction surveys; installation of exclusion fencing, where appropriate; trapping and relocation; construction monitoring; and off-site habitat conservation in perpetuity through purchase of California Department of Fish and Wildlife-approved credits from a mitigation bank or other acceptable means.

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1.0 INTRODUCTION

Hydrogen Energy California LLC (HECA LLC) is proposing to build an Integrated Gasification Combined Cycle polygeneration project (HECA or the Project) in Kern County, California (Figure 1). HECA LLC is owned by SCS Energy California LLC. The Project will gasify a 75 percent coal and 25 percent petroleum coke (petcoke) fuel blend to produce synthesis gas (syngas). Syngas produced via gasification will be purified to hydrogen-rich fuel, which will be used to generate low-carbon baseload electricity in a Combined-Cycle Power Block, low-carbon nitrogen-based products in an integrated Manufacturing Complex, and carbon dioxide (CO₂) for use in enhanced oil recovery (EOR).¹

The Project will gasify blends of petcoke and coal to produce hydrogen to fuel a combustion turbine operating in combined-cycle mode. The Gasification Block feeds a 390-gross-megawatt combined-cycle plant. The net electrical generation output from the Project will provide California with approximately 300-megawatt output of low-carbon baseload electrical power to the grid. The Project will also use the hydrogen produced in the gasifier to produce low-carbon nitrogen-based fertilizer in an integrated Manufacturing Complex.

The fertilizers and power produced by the HECA Project will have a low-carbon footprint, because more than 90 percent of the CO₂ in the syngas will be captured and approximately 3 million tons per year of CO₂ will be transported via pipeline for use in EOR, which results in simultaneous sequestration (storage) of the CO₂ in a secure geologic formation (HECA, 2012). CO₂ will be transported (via an approximately 3.4-mile-long pipeline) for use in EOR in the adjacent Elk Hills Oil Field (EHOF), which is owned and operated by Occidental of Elk Hills, Inc. (OEHI) (hereafter referred to as the OEHI Project).

The U.S. Department of Energy is providing financial assistance to the HECA Project under the Clean Coal Power Initiative Round 3 via a cost-sharing agreement with HECA LLC. OEHI will construct and operate the OEHI Project, which includes the processing facilities, wells and pipelines in the EHOF that are proposed for CO₂ EOR and sequestration.

The EHOF is currently being operated in compliance with a 1995 Biological Opinion issued by the U.S. Fish and Wildlife Service (USFWS), and a related 1997 Memorandum of Understanding (MOU) between OEHI and the California Department of Fish and Wildlife (CDFW; formerly the California Department of Fish and Game) that has twice been updated, and remains in effect until 2014. OEHI reinitiated consultations with USFWS and CDFW in 2002 to support a multi-decade Habitat Conservation Plan (HCP) for the EHOF. The new HCP is being negotiated in contemplation of continued operations consistent with the Supplemental Environmental Impact Statement/Program Environmental Impact Report for the federal government's divestment of the

¹ This carbon dioxide will be compressed and transported via pipeline to the adjacent EHOF, where it will be injected. The CO₂ EOR process involves the injection and reinjection of carbon dioxide to reduce the viscosity and enhance other properties of the trapped oil, thus allowing it to flow through the reservoir and improve extraction. During the process, the injected CO₂ becomes sequestered in a secure geologic formation. This process is referred to herein as CO₂ EOR and Sequestration.

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EHOFF. OEHI anticipates that the 1995 Biological Opinion and the amended MOU will be replaced by new Section 10 and Section 2081 permits supported by the HCP at some point in the future. However, until that occurs, the Biological Opinion remains in effect indefinitely, and the MOU remains in effect until December 31, 2014.

The California Energy Commission (CEC) has the statutory responsibility for licensing the Project and related facilities, and conducts a certified regulatory program under the California Environmental Quality Act. As part of that process, an Amended Application for Certification (AFC) was submitted to the CEC on May 2, 2012 (CEC Docket Number 08-AFC-8A). This Application and the information contained herein is being provided to CDFW to allow CDFW to participate effectively in the CEC certification process to ensure that required incidental take coverage for the HECA Project and OEHI Project are included in the CEC certification.

1.1 APPLICANT INFORMATION

Applicant Information

SCS Energy LLC
30 Monument Square, Suite 235
Concord, MA 01742
Project Manager: Marisa Mascaro
Phone: 978-287-9529
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Email: MMascaro@scsenergylc.com

Primary Contact: Marisa Mascaro, same address and phone number as above

Principal Officer: James Croyle

Registered Agent for Service of Process: Dale Shileikis, URS Corporation

1.2 PROJECT SITE LOCATION AND OVERVIEW

The 453-acre Project Site is approximately 7 miles west of the city of Bakersfield, and approximately 2 miles northwest of the unincorporated community of Tupman in western Kern County, California. The Project Site is near an oil-producing area known as the Elk Hills Oil Field (Figure 2). HECA has the option of purchasing the Project Site, as well as an additional 653 acres adjacent to the Project Site, herein referred to as the Controlled Area (Figure 3). The Project Site and Controlled Area are currently used for farming purposes, including the cultivation of cotton, alfalfa, and onions. The OEHI Project site is comprised of a portion of the existing EHOFF.

1.3 SPECIES COVERED

Incidental take coverage is requested for five wildlife species listed below.

- Tipton kangaroo rat (*Dipodomys nitratooides nitratooides*) – State Endangered
- Giant kangaroo rat (*Dipodomys ingens*) – State Endangered
- Nelson’s antelope squirrel (*Ammospermophilus nelsoni*) – State Threatened
- San Joaquin kit fox (*Vulpes macrotis mutica*) – State Threatened
- Swainson’s hawk (*Buteo swainsoni*) – State Threatened

As described in Section 3 and Table 1 of this document, other species were considered, but incidental take authorization is not requested because the species were not detected during completed protocol surveys, and key habitat characteristics typical of the species are not present in the HECA Project or OEHI Project areas.

2.0 PROJECT DESCRIPTION

The 453-acre Project Site is currently used for active agricultural purposes, including cultivation of cotton, alfalfa, and onions. HECA also has the option to purchase 653 acres adjacent to the Project Site, over which HECA will control access and future land uses. The Project will generate a nominal 300-megawatt output of low-carbon baseload electrical power. The Project will capture more than 90 percent of the CO₂ in the production of the hydrogen fuel, and transport (via pipeline) approximately 3 million tons per year of CO₂ to the EHOE for EOR and sequestration. In addition, the Project will use the hydrogen produced in the gasifier to produce low-carbon nitrogen-based fertilizer in an integrated Manufacturing Complex.

In addition to the Project Site, the Project includes construction and operation of five linear facilities, which include (1) an approximately 2-mile-long electrical transmission line to a new Pacific Gas and Electric Company (PG&E) switching station; (2) an approximately 13-mile-long natural gas interconnection with an existing PG&E natural gas pipeline; (3) an approximately 15-mile-long process water supply pipeline from the Buena Vista Water Storage District (BVWSD); (4) an approximately 1-mile-long potable water supply pipeline from West Kern Water District; and (5) an approximately 5-mile-long industrial railroad spur that will connect to the San Joaquin Valley Rail Road.

The OEHI Project will include construction and operation of three primary EOR components, including (1) an approximately 3.4-mile-long CO₂ Pipeline from HECA to the Elk Hills Oil Field; (2) a CO₂ EOR Processing Facility at the southern terminus of the CO₂ Pipeline; and (3) three Satellite Gathering Stations during the initial project demonstration phase. Additional Satellite Gathering Stations will be added in future phases but these locations, shown on Figure 2, are conceptual and subject to change. The OEHI Project will include approximately 136 acres of development within the EHOE (Stantec, 2012a). This development will include approximately 720 production and injection wells, including 150 new well installations. EOR development will also include approximately 652 miles of new pipeline within the EHOE.

2.1 Construction Activities

Construction activities associated with each of the HECA and OEHI project components, including avoidance, minimization, and conservation measures, are described below, followed by descriptions of operation and maintenance of the facilities and the Project schedule.

2.1.1 Power Generating Facility

The 453-acre Project Site is intensively cultivated for the production of alfalfa, cotton, and onions, and has little habitat value for native plants or animals. The closest area with habitat value for native plants or animals is the Kern River Flood Control Channel (KRFCC), approximately 700 feet south of the Project Site. The majority of the 653-acre Controlled Area will remain in active agriculture and act as a buffer between the Project and the KRFCC. The western border of the Tule Elk State Natural Reserve is approximately 1,700 feet to the east of the Project Site.

Construction activities for the Project will occur throughout the 48-month construction period. All construction laydown and parking areas will be within the Project Site and the 91-acre construction laydown and parking area in the Controlled Area. Onsite construction activities include clearing and grubbing, grading, hauling, layout of equipment, delivery and handling of materials and supplies, and Project construction and testing operations. The Project Site occurs in an area of relatively flat topography. Site grading will occur as necessary to form level building pads for major process units.

Construction site access will be via Dairy Road for truck deliveries, and Adohr Road for construction craft vehicles arriving and departing the site. Initial site preparation will include construction of temporary access roads, parking, laydown areas, office and warehouse facilities, installation of erosion control measures, and other improvements necessary for construction. Erosion control measures will include construction of stormwater retention basins and related site drainage facilities to control runoff within the Project Site boundary. Existing drainage patterns outside the Project Site boundary will remain unchanged, and no runoff from outside the Project Site boundary will flow onto the Project Site.

2.1.2 Electrical Transmission Line and Switching Station

An electrical transmission line will interconnect the Project to PG&E's future switching station. The transmission line will be constructed and owned by HECA up to the point of interconnection. The power generated by the Project will be connected to the existing PG&E system by a 230-kilovolt transmission line that will be constructed as part of the Project. This single-circuit line will be connected to a new switchyard at the Project Site.

The proposed electrical transmission line route is approximately 2 miles long to HECA's property boundary, and passes through previously disturbed areas or active agriculture, predominantly pistachio orchards, alfalfa, and cotton. Construction of the line will require installing approximately 26 (15 offsite and 11 onsite) tubular-steel transmission structures and the supporting foundations.

The electrical transmission line route extends east from the Project Site to a new PG&E switching station (adjacent to the existing Midway-Wheeler Ridge transmission lines) as shown on Figure 4, Sheet 4. The new PG&E switching station will be constructed at the eastern terminus of the electrical transmission line, approximately 2 miles east of the Project Site and next to Elk Valley Road. Access to the switching station site will be along an existing unimproved farm road from Morris Road or Elk Valley Road. The electrical transmission switching station will be designed, constructed, owned, and operated by PG&E.

The area occupied by the PG&E switching station will be approximately 417 feet by 417 feet. Portions of the site will be excavated to install a grounding grid, underground control and protection cabling, and foundations. It is anticipated that "dead-end" structures to terminate the transmission line from the HECA Site will be approximately 30 feet tall near the western end of the switching station site. A similar set(s) of structures at the eastern end of the station for the incoming lines from Midway and the outgoing lines to Wheeler Ridge will also be required. The height of a two-level structure will be on the order of 50 to 60 feet. The station will also have

structures associated with interconnecting buses and cable “drops” to the circuit breakers. The height of these structures will be on the order of 20 to 30 feet.

Approximately 15 steel poles are expected to be required outside of the Project Site. Construction of the interconnection line will consist of installing footings, poles, insular and hardware, and pulling conductor and shield wires. The new transmission line interconnection will be placed in an approximately 100-foot-wide permanent right-of-way (ROW).

Construction of the new 230-kilovolt transmission line interconnection will require approximately 3 months. It will be scheduled for completion and be operational in time for generation testing of the Project. HECA will provide for the transmission line via a Large Generator Interconnection Agreement up to the point of interconnection at the future PG&E switching station.

Upon completion of the linear installation, agricultural uses may be reestablished along the linear route within the 100-foot-wide permanent ROW. Orchards will be limited to 25 feet in height within the permanent ROW.

2.1.3 Natural Gas Supply

A 13-mile natural gas linear will interconnect with a PG&E natural gas pipeline north of the Project Site. The interconnect will consist of one tap off the existing natural gas line, and one metering station at the beginning of the natural gas linear adjacent to a PG&E Inlet. The metering station will be up to 100 feet by 100 feet, and 8 feet tall, surrounded by a chain-link fence. In addition, there will be a metering station at the end of the natural gas linear, on the western side of the Project Site, and a pressure-limiting station on the Project Site. PG&E will construct and own the natural gas pipeline.

The majority of the natural gas linear extends across areas used for active agriculture and existing roadways. However, the natural gas linear is adjacent to several areas with natural habitat value near Interstate 5 (I-5), and at the northern terminus near Magnolia Avenue.

The natural gas linear will require a 50-foot construction ROW and a 25-foot permanent ROW; however, most of the ROW will be in cultivated fields or other disturbed habitat types adjacent to paved and unpaved roads.

Wetland features adjacent to the proposed natural gas linear ROW will be avoided. Non-wetland potential waters of the U.S. within the natural gas pipeline construction limits are degraded, seasonally ponded claypan depressions. If avoidance of non-wetland waters is not feasible, the feature(s) will be temporarily disturbed by the construction activities during installation of the natural gas pipeline, and the site will be restored to pre-construction condition.

Construction of the natural gas pipeline interconnection will involve a variety of crews performing the following typical pipeline construction activities: hauling and stringing the pipe along the route; welding, radiographic inspection, and coating the pipe welds; trenching; lowering the pipe into the trench; backfilling the trench; hydrostatic testing of the pipeline; tying into the existing pipeline; purging the pipeline; and cleaning up and restoring construction areas.

Roads and ROWs will be restored to specifications of the involved agencies. Open trenching will be minimized, and trenches will be covered or ramped when left overnight. In areas with habitat value and in agricultural areas, the topsoil from the trenching will be set aside, preserved, and used to cover the excavation.

Construction of the natural gas pipeline interconnection will take approximately 6 months. It will be scheduled to be finished and operational in time to provide test gas to the HECA Project. Construction will occur in accordance with a traffic management plan to minimize impacts to traffic traveling on the affected roadways. Affected areas will be restored to their original state to minimize erosion.

2.1.4 Water Supply Pipelines

For process water, the Project will use brackish groundwater supplied by the BVWSD via a new 15-mile pipeline. Potable water for drinking and sanitary use will be supplied by West Kern Water District (WKWD), via a new 1-mile-long pipeline. Installation of the process water and potable water pipelines will involve industry standard construction activities for pipelines, including trenching; hauling and stringing of pipe along the routes; welding; radiographic inspection and coating of pipe welds; lowering welded pipe into the trench; hydrostatic testing; and backfilling and restoring the approximate surface grade. Construction of the water pipelines is expected to take approximately 6 months to complete.

2.1.5 Process Water Supply Pipeline

A new 15-mile, 30-inch-diameter pipeline will convey brackish groundwater supplied from the BVWSD to be used for process water by the Project. BVWSD will construct and own the process water supply pipeline, and approximately 14.5 miles of the pipeline will be in an existing BVWSD ROW. The proposed process water pipeline will be constructed entirely in an existing unpaved road, or within areas that are currently actively farmed; therefore, no direct impacts to natural habitats are anticipated. The brackish water will be treated at the Project Site to meet all process and utility water requirements. The process water supply pipeline will require a 50-foot construction ROW and a 25-foot permanent ROW.

In addition, BVWSD will own, construct, operate, and maintain the well field that will provide brackish groundwater for the Project's process water supply. This well field will be in the northwestern portion of BVWSD's service area in active agricultural fields near the West Side Canal, in the vicinity of Seventh Standard Road, at the northern end of the 15-mile-long process water line. It is currently anticipated that there will be up to five groundwater extraction wells. Two of these wells will provide operational redundancy. The maximum depth of the wells will be approximately 300 feet below ground surface.

BVWSD addressed the groundwater extraction wells and the process water supply pipeline in their Draft and Final Environmental Impact Reports for BVWSD's Groundwater Management Program, issued in October 2009 and December 2009, respectively (BVWSD, 2009a; 2009b). The Final Environmental Impact Report for the Groundwater Management Program (State Clearinghouse No. 2009011008) concludes that the wells and the process water pipeline do not result in significant impacts to any federally listed species.

2.1.6 Potable Water Pipeline

For drinking and sanitary use, the Project will use potable water supplied by WKWD. A new 4-inch-diameter potable water line will be constructed, owned, and maintained by HECA LLC.

The potable water line will be approximately 1 mile in length. This pipeline will require a 10-foot construction and permanent ROW that will be located in the proposed electrical transmission line ROW. Most of the proposed ROW is in or adjacent to existing dirt access roads, or in cultivated fields.

2.1.7 Industrial Railroad Spur

A new, 5-mile industrial railroad spur will be constructed that will connect the Project Site to the existing San Joaquin Valley Railroad Buttonwillow Branch (formerly called the SP Buttonwillow Branch). Two public at-grade crossings may be required, and several private crossings will be needed for farmers' access to croplands and the irrigation canal. The industrial railroad spur will require a 75-foot construction ROW, 60-foot permanent ROW, and a 3-acre rail laydown area. Construction of the railroad spur is expected to span approximately 5 months.

2.1.8 OEHI Carbon Dioxide Pipeline and EOR

An approximately 3.4-mile-long, 12-inch-diameter pipeline will be constructed to transfer the CO₂ from the Project Site to the OEHI CO₂ Processing Facility used by OEHI for injection into deep underground hydrocarbon reservoirs for CO₂ EOR and sequestration. Additional components of the CO₂ pipeline will include metering facilities at the pipeline origin and terminus, a cathodic protection system, and four emergency block valves. Two of the block valves will be automated and two will be manual block valves.

The CO₂ pipeline route originates at the southern portion of the Project Site and will be constructed using a combination of standard open-trench installation and Horizontal Directional Drilling (HDD). One HDD section will be approximately 500 feet in length under the levees associated with the West Side/Outlet Canal crossing. A second HDD section will be approximately 2,000 feet long, and will be used to install the pipeline under the KRFCC and the California Aqueduct. On the southern side of the Aqueduct, the pipeline alignment extends southeast and south to the OEHI CO₂ Processing Facility, and parallels existing private roads. OEHI will construct and own the pipeline.

With the exception of HDD crossings where the depth of the CO₂ pipeline may reach 100 feet below grade, the CO₂ Pipeline will be buried approximately 5 feet below grade. Installation of the CO₂ supply pipeline will involve typical construction activities, including trenching; hauling and stringing pipe along routes; welding; radiographic inspection and coating pipe welds; lowering welded pipe into the trench; backfill of the trench; hydrostatic testing of the pipeline; purging the pipeline; and cleanup and restoration of construction areas. Grade cuts will be restored to their original contours, and affected areas will be restored to their original condition to minimize erosion. The pipeline will be protected by cathodic protection, and monitored by independent leak-detection systems.

Construction of the CO₂ pipeline is expected to take approximately 6 months to complete. The CO₂ pipeline will require a 50- to 80-foot construction ROW and a 25-foot permanent ROW.

HDD involves using a drilling rig that will bore a horizontal hole under water crossings. At each of these crossings, a laydown area (or entry/exit pit) has been identified on either side of the water course to accommodate the HDD installation (see Figure 4, Sheet 4). The temporary disturbance area will be approximately 120 feet by 100 feet for each HDD entry pit; and approximately 75 feet by 100 feet for each HDD exit pit (Stantec, 2012b).

Best management practices for HDD will include silt fencing around the drill sites, energy dissipation devices for discharging water from hydrostatic testing of the pipeline, selecting drilling fluids for environmental compatibility, and removing spent fluids from the areas immediately adjacent to the water bodies for safe disposal, and to prevent contamination. In addition, soil erosion control measures will be implemented to prevent runoff and impacts to water quality.

Construction of the CO₂ EOR Processing Facility and Satellite Gathering Stations will occur within the existing EHO. All construction laydown will also be within the existing EHO. Onsite construction activities include clearing and grubbing, grading, hauling, layout of equipment, delivery and handling of materials and supplies, and construction and testing operations.

2.2 Operation and Maintenance

Project operation and maintenance will occur within the Project Site. The adjacent Controlled Area will remain in active agriculture similar to the existing condition. Access to linears will be limited in nature, and will be along existing access roads or access roads developed during initial installation activity. HECA LLC will own, operate, and maintain the approximately 2-mile transmission line up to the interconnection with a future PG&E switching station. It is anticipated that annual maintenance of the electrical transmission line will be provided for under an agreement between PG&E and the Project. The electrical transmission line is located entirely within areas that are actively farmed or developed. Most of the maintenance will be routine and can be scheduled during periods when damage to the crops and land can be minimized. Maintenance activities will be conducted by personnel trained to be aware of the presence of sensitive wildlife.

PG&E will own, operate, and maintain the natural gas pipeline. Maintenance of the natural gas pipeline will follow PG&E corporate policies and protocols. Long-term maintenance needs of the natural gas pipeline will be minimal during the 25-year lifespan of the Project; therefore, they are not quantified in this document.

BVWSD will own, operate, and maintain the approximately 15-mile, 30-inch-diameter process water pipeline and associated wells. Annual maintenance of the process water pipeline and associated groundwater wells will be conducted by BVWSD. Maintenance activities of the wells and the pipeline will follow BVWSD corporate policies and protocols. Long-term maintenance needs of the process water pipeline will be minimal during the 25-year lifespan of the Project, and therefore are not quantified in this document.

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HECA LLC will own, operate, and maintain the approximately 1-mile potable water pipeline. Maintenance activities of the pipeline will include:

- Annual reconnaissance of the pipeline ROW;
- Annual inspection and exercising (opening and closing for one cycle) of valves, as necessary;
- Annual vegetation removal, re-grading, and application of dirt for the access road after wet periods and pipe work, as necessary; and
- Replacement of pipeline components (lining and coating, valves, and joints), as determined necessary by routine inspection.

Long-term maintenance needs of the potable water pipeline will be minimal during the 25-year lifespan of the Project; therefore, they are not quantified in this document.

HECA currently anticipates that it will own, operate, and maintain the approximately 5-mile railroad spur. Regardless of final ownership of the spur, maintenance activities will consist of routine annual maintenance activities and programmed maintenance conducted on a periodic basis. Annual maintenance activities consist of visual inspections; vegetation control; spot surfacing, and lining of rough spots in the track; and adjusting/lubrication of turnouts. In addition, any warning devices at road crossings will be inspected as frequently as monthly.

Programmed major maintenance consists of surfacing and lining the rail line, typically every 3 to 5 years; replacing the rail, potentially once during the life of the Project; and replacing 15 percent of the timber ties on a 10-year cycle. If concrete ties are used, the ties will not need to be replaced. Major maintenance activities will be conducted using on-track equipment. Replaced materials will be removed from the ROW and recycled. Timber ties will be disposed of by incineration, landfill disposal, or other approved disposal options.

OEHI will construct, own, operate, and maintain the CO₂ pipeline and the related components of the OEHI Project. Maintenance of the CO₂ pipeline and other EOR facilities will follow existing OEHI operational procedures, as required by the existing USFWS Biological Opinion and the related 1997 MOU between OEHI and the CDFW, which remains in effect until 2014. The EOR facility operations will be similar to OEHI operations of existing facilities at the EHOE. Operations activities include facility inspection and maintenance. Inspection and maintenance needs of the CO₂ pipeline and associated EOR facilities will include annual reconnaissance of the pipeline ROW; annual inspection and exercising of valves, as necessary; maintenance of access routes, as necessary; and replacement of pipeline components (lining and coating, valves, and joints), as determined necessary by routine inspection.

2.3 Project Schedule

The anticipated schedule milestones for the Project are as early as:

Completion of CEC permitting process..... Late 2013
Commencement of pre-construction and construction activities..... Late 2013
Commencement of commercial operation of the Project 2017

3.0 IMPACTS ANALYSIS

The following section analyzes the potential of the HECA Project and OEHI Project to unintentionally take California listed species. Table 1 summarizes each of the listed species initially evaluated based on available information. Of the species identified in Table 1, only those species that are confirmed to be present or that are likely to be present are discussed in greater detail. Those species that are classified as “low” or “very low” for the likelihood of occurring within the HECA Project or OEHI Project areas are not discussed further. Blunt-nosed leopard lizards are known to be present in the vicinity of the Project areas, but are not included in this take permit application because they are a Fully Protected species; take of this species will be avoided completely.

For the five species that may occur within the Project areas, the impact analysis evaluates whether the anticipated take will jeopardize the continued existence of a species. Variables considered in this evaluation include the species’ capability to survive and reproduce, existing population trends, known threats, and reasonably foreseeable impacts on the species from other related projects and activities.

This section also describes the environmental setting of the HECA Project and OEHI Project, including the biological resources in the Project Area, defined in this application as the 453-acre Project Site, as well as the construction footprints of the associated linear facilities and the affected areas of the EHO. As required by the CEC guidelines, the evaluation also includes buffers from the proposed Project area—including a 1-mile buffer from the Project Site, and 1,000-foot buffers from all associated linear facilities (Figure 5). Information regarding the environmental setting within 35 miles of the Project Site is included when a regional perspective is required.

3.1 PROJECT SETTING

The Project Site is in unincorporated Kern County approximately 2 miles northwest of the unincorporated community of Tupman, and south of Adohr Road. In general, the land use in this portion of Kern County is resource-based oil exploration and production, which provides a large segment of the employment base, as well as agricultural production. The 453-acre Project Site is comprised of portions of two agricultural parcels in Section 10 within Township 30 South, Range 24 East.

The Project Site is currently used for farming purposes, including cultivation of cotton, alfalfa, and onions. Land surrounding the Project Site, including the Controlled Area, is also used primarily for farming, particularly the cultivation of alfalfa and cotton. The Outlet Canal, KRFC, and the California Aqueduct (State Water Project) are 500, 700, and 1,900 feet south of the Project Site, respectively. The western border of the Tule Elk State Natural Reserve is approximately 1,700 feet to the east of the Project Site. The nearest single-family dwellings are approximately 1,400 feet to the east. HECA has an option to purchase the Project Site and Controlled Area.

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Table 1
State Listed Wildlife Species with Potential to Occur within the Project Area

Common Name	Scientific Name	Listing Status		Likelihood of Occurrence in Project Area	Habitat Associations
		Federal	State		
Reptiles					
Blunt-nosed leopard lizard	<i>Gambelia sila</i>	E	E and FP	High Observed in 2008 approximately 1 mile south of the Project Site in the vicinity of the proposed CO ₂ pipeline alignment and in 2010 near the northern terminus of the natural gas linear. Not detected during 2012 surveys of current Project linear facilities.	Inhabits sparsely vegetated alkali and desert scrub habitats in areas of low topographic relief. Preferred habitat includes semiarid grasslands, alkali flats, and washes.
Giant garter snake	<i>Thamnophis gigas</i>	T	T	Very Low Last recorded in 1940 within the region. Likely extirpated from Kern County	Requires adequate water during its active season, herbaceous wetland vegetation as cover, openings in wetland vegetation for basking, and higher elevations for refuge from flood waters during the dormant season. Adapted to irrigation ditches and canals.

**Table 1
State Listed Wildlife Species with Potential to Occur within the Project Area (Continued)**

Common Name	Scientific Name	Listing Status		Likelihood of Occurrence in Project Area	Habitat Associations
		Federal	State		
Birds					
Swainson's hawk	<i>Buteo swainsoni</i>	SC	T	High Individuals observed foraging over the Tule Elk Preserve, with potential nest structures 1 mile east of Project Site. Active nest confirmed in 2011 approximately 500 feet south of process water linear and less than 3 miles west of the Project Site. Active nest confirmed in 2012 within 1/4 mile of the existing rail line and proposed natural gas pipeline.	Inhabits open grasslands and desert-like habitats, as well as agricultural areas.
American peregrine falcon	<i>Falco peregrinus</i>	—	E	Low Nesting habitat is not present in the Project Area; migrants may pass through area.	Prefer open habitats such as grasslands, tundra and meadows. Nests on cliff faces and crevices.
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	SC and C	E	Very Low Poor nesting habitat; migrants may pass through area.	Inhabits open woodlands with clearings and a dense shrub layer. Often frequent woodlands near streams, rivers or lakes.
Southwestern willow flycatcher	<i>Empidonax traillii eximius</i>	E	E	Very Low Poor nesting habitat; migrants may pass through area.	Breeds in dense riparian habitats along rivers, streams or other wetlands.
Least Bell's vireo	<i>Vireo bellii pusillus</i>	E	E	Very Low Poor nesting habitat; migrants may pass through area.	Prefers dense, shrubby vegetation, woodlands, scrub oak, coastal chaparral, and mesquite brushlands, often near water in arid regions.

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Table 1
State Listed Wildlife Species with Potential to Occur within the Project Area (Continued)

Common Name	Scientific Name	Listing Status		Likelihood of Occurrence in Project Area	Habitat Associations
		Federal	State		
Mammals					
Nelson’s antelope squirrel	<i>Ammospermophilus nelsoni</i>	—	T	High Documented occurrences are only known from the west side of the California Aqueduct (Elk Hills area). Individuals observed in vicinity of CO ₂ linear in 2012, 2008 and 2009 approximately 2 miles south of the Project Site (Stantec, 2013). No habitat for this species at Project Site or along other linear components, except CO ₂ linear alignment west of California Aqueduct.	Dry, sparsely vegetated loam soils. Need widely scattered shrubs, forbs and grasses in broken terrain with gullies and washes.
Giant kangaroo rat	<i>Dipodomys ingens</i>	E	E	High Observed approximately 1 mile south of the Project Site in 1990. Per February 2012 communication with CDFW, this species is expected on west side of California Aqueduct, but not likely to occur east of the Aqueduct. Stantec documented precincts along the CO ₂ pipeline alignment approximately 0.3 mile south of the Aqueduct in 2012 (Stantec, 2013).	Saltbush scrub and sink scrub communities in the Tulare Lake Basin of the southern San Joaquin Valley. Requires soft friable soils, which escape seasonal flooding where it will dig burrows in elevated soil mounds at the base of shrubs.

Table 1
State Listed Wildlife Species with Potential to Occur within the Project Area (Continued)

Common Name	Scientific Name	Listing Status		Likelihood of Occurrence in Project Area	Habitat Associations
		Federal	State		
Tipton kangaroo rat	<i>Dipodomys nitratoides nitratoides</i>	E	E	High Previously documented within 1 mile of the Project Site and within the BRSA for the linear Project components.	Valley sink scrub and valley saltbush scrub in the Tulare basin. Sparse top moderate shrub cover is associated with high-density populations. Terrain not subject to flooding is an important factor for permanent occupancy.
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	E	T	High URS biologists observed active dens in vicinity of CO ₂ linear in 2008 and potential tracks/sign observed within the KRFCC in 2009. Stantec biologists observed a potentially active den approximately 0.5 mile south of the Aqueduct in 2012 (Stantec, 2013).	Chenopod scrub, grasslands, and other habitats. Sometimes forage in agricultural areas.

Notes:

BLM = Bureau of Land Management Sensitive Species
C = Candidate Species
CDFW = California Department of Fish and Wildlife
CO₂ = carbon dioxide
DFG:WL = Department of Fish and Game Watch List
E = Federal/State Endangered
FP = State Fully Protected
IUCN:EN = International Union for Conservation of Nature and Natural Resources: Endangered
KRFCC = Kern River Flood Control Channel
SC = Federal/California Species of Concern
T = Federal/State Threatened

Land uses in the vicinity of the approximately 13-mile-long natural gas pipeline route are primarily active agricultural land (mainly alfalfa cultivation), disturbed and/or developed areas, and patches of open/undeveloped land (Allscale Scrub).

Land uses in the vicinity of the approximately 15-mile-long process water pipeline are primarily farming (mainly alfalfa, cotton, and wheat cultivation), and orchards (pistachio). Much of the land between the West Side Canal and the KRFCC is Allscale Scrub.

Land uses in the vicinity of the approximately 1-mile-long potable water pipeline consist of previously disturbed habitat and farming (mainly alfalfa, cotton, oat, and wheat cultivation).

Existing land uses in the vicinity of the approximately 2-mile-long electrical transmission line consists of previously disturbed habitat and farming (mainly alfalfa, cotton, oat, and wheat cultivation). The new PG&E switching station at the terminus of the electrical transmission line will occupy approximately 4 acres in a field that is currently cultivated for alfalfa.

The OEHI Project Site consists of approximately 136 acres within the EHOF, and approximately 29 acres that will be temporarily disturbed to construct the CO₂ Pipeline (Stantec, 2012a). The EHOF is a mix of developed lands used for oil production and undeveloped lands. Land uses in the vicinity of the OEHI Project include farming (mainly alfalfa cultivation), open/undeveloped land (Allscale Scrub; Sawyer, Keeler-Wolf, and Evens, 2009), and resource extraction (oil production). The CO₂ pipeline will cross under the West Side/Outlet Canal, KRFCC, and the California Aqueduct using HDD.

Existing conservation lands within 35 miles of the Project Site are listed in Table 2; Figure 5, Existing Natural Resource Conservation Areas, shows those areas within 10 miles, with the exception of the *Elk Hills Unit Draft Habitat Conservation Plan* area, whose boundaries have not yet been published.

3.2 SPECIES IMPACTS

Details of potential adverse effects to species listed under the CESA for both the HECA Project and the OEHI Project are described below. Without implementation of proposed avoidance, minimization, and mitigation measures, the construction, operation, maintenance, and decommissioning over the life of the HECA Project and OEHI Project may cause take of these species.

3.2.1 Tipton Kangaroo Rat

Tipton kangaroo rats are presumed to be present where habitat is potentially suitable for this species, including several segments of the natural gas pipeline (Figure 6). This species is not expected to be present south of the California Aqueduct along the CO₂ pipeline route, based on discussions with CDFW (pers. com. Vance, 2012).

**Table 2
Existing Natural Resource Conservation Areas near the Project Site**

Conservation Area	Approximate Distance (miles)	Direction from Project Site
California Aqueduct San Joaquin Draft Habitat Conservation Plan (developed by Department of Water Resources)	0.3	Southeast
Tule Elk State Reserve	0.3	East
Lokern Ecological Reserve	0.5	South
Occidental of Elk Hills, Inc., Elk Hills Unit Draft Habitat Conservation Plan	1.0	South
Kern Water Bank	1.0	East
Coles Levee Ecosystem Preserve	3.5	Southeast
Buttonwillow Ecological Reserve	6.5	North
Buena Vista Aquatic Recreation Area	7.8	Southeast
Northern Semitropic Ridge Ecological Reserve	22.5	Northwest
Carrizo Plain National Monument	22.7	West
Kern and Pixley National Wildlife Refuges	33.4	Northwest

The Tipton kangaroo rat has the potential to be directly impacted by vehicle strikes, entrapment in open trenches, and/or entombment within a burrow during the installation and maintenance of the natural gas pipelines. Tipton kangaroo rats may become trapped in pipes, or injured or killed by predators attracted to construction-related food or trash at the Project Site.

To minimize potential take of all small mammals, the natural habitat areas will be fenced and trapped for five consecutive nights (measure BIO-15) prior to ground disturbance. All trapping will be conducted according to agency-approved trapping protocols, and mortality of trapping is not expected to exceed 1 percent. Kangaroo rats will be relocated to the nearest suitable habitat outside of the construction area to minimize stress associated with the relocation, and to ensure that diseases and/or parasites are not carried to another population.

In addition to small mammal trapping and relocation (BIO-15), the following measures described in Section 4 are proposed to avoid or minimize potential take of the Tipton kangaroo rat: Terrestrial Wildlife Pre-Construction Survey (BIO-4), Worker Education Program (BIO-7), Operations and Maintenance Activities (BIO-8), and Ground Disturbance Monitoring for Terrestrial Wildlife (BIO-16). These mitigation measures will minimize vehicle strikes, construction-related food or trash concerns, and off-road vehicle activity. As described in the measure BIO-7, construction in areas of habitat that are suitable for Tipton kangaroo rats will occur only during daylight hours; open trenches will be covered if left overnight; and pipe storage will only occur within identified, secured construction areas. Direct impacts to Tipton's kangaroo rats are not likely to involve more than ten individuals over the life of the Project. It is expected that impacts to Tipton kangaroo rat will be fully mitigated by all of the aforementioned

mitigation measures, and through permanent habitat conservation described in Section 5. All mitigation measures for the Tipton kangaroo rat are discussed in more detail in Section 4 and Section 5. Potential incidental take of Tipton kangaroo rat will be fully mitigated by implementation of these measures.

3.2.2 Giant Kangaroo Rat

Giant kangaroo rats are presumed to be present where habitat is potentially suitable for this species, including the portion of the CO₂ pipeline immediately south of the California Aqueduct (Figure 7). This species is less frequent north of the California Aqueduct, but may be present in suitable habitat within the valley floor, based on discussions with CDFW (pers. com. Vance, 2012). No precincts or “hay stacks” were seen within the valley floor area during blunt-nosed leopard lizard surveys.

Potential impacts to giant kangaroo rat include vehicle strikes, entrapment in open trenches, and/or entombment within a burrow during the installation and maintenance of the CO₂ pipeline. Giant kangaroo rats may become trapped in pipes, or injured or killed by predators attracted to construction-related food or trash at the Project Site.

To minimize potential take of all small mammals, areas of natural habitat will be fenced and trapped for five consecutive nights (BIO-15) prior to the start of construction. All trapping will be conducted according to approved trapping protocols, and mortality of trapping is not expected to exceed 1 percent. Giant kangaroo rats will be relocated to the nearest suitable habitat outside of the construction area to minimize stress associated with the relocation, and to ensure that diseases and/or parasites are not carried to another population.

In addition to small mammal trapping and relocation (BIO-15), the following measures described in Section 4 are proposed to avoid or minimize potential take of the giant kangaroo rat: Terrestrial Wildlife Pre-Construction Survey (BIO-4), Vehicle Traffic Protection Measures (BIO-8), Worker Education Program (BIO-7), and Operations and Maintenance Activities (BIO-8), and Ground Disturbance Monitoring for Terrestrial Wildlife (BIO-16). These mitigation measures will minimize vehicle strikes, construction-related food or trash concerns, and off-road vehicle activity. As described in measure BIO-7, construction in areas with suitable habitat for giant kangaroo rats will occur only during daylight hours; open trenches will be covered if left overnight; and pipe storage will only occur within identified, secured construction areas. Direct impacts to giant kangaroo rats are not likely to involve more than ten individuals over the life of the Project, due to the size and duration of the Project, and the population density in the affected area. It is expected that impacts to giant kangaroo rat will be fully mitigated by all of the aforementioned mitigation measures. All mitigation measures for the giant kangaroo rat are discussed in more detail in Section 4 and Section 5. Potential incidental take of giant kangaroo rat will be fully mitigated by implementation of these measures.

3.2.3 Nelson’s Antelope Squirrel

Nelson’s antelope squirrels are presumed to be present where habitat is potentially suitable for this species. This species has been observed in the southern portion of the CO₂ pipeline route

and the area of the proposed CO₂ EOR Processing Facility (Figure 8). This species is less frequent north of the California Aqueduct, but may be present in suitable habitat within the valley floor. However, Nelson's antelope squirrel was not observed during blunt-nosed leopard surveys of all potentially suitable habitats in the Project Area north of the California Aqueduct conducted in 2012.

Potential impacts to Nelson's antelope squirrel will include vehicle strikes, entrapment in open trenches, and/or entombment within a burrow during the installation and maintenance of the CO₂ pipeline or construction of the CO₂ EOR Processing Facility. During construction, Nelson's antelope squirrels may also become trapped in pipes, or injured or killed by predators attracted to construction-related food or trash at the Project Site.

To minimize potential take of all small mammals, areas of natural habitat will be fenced and trapped for five consecutive nights (BIO-15) prior to the start of construction. All trapping will be conducted according to approved trapping protocols, and mortality of trapping is not expected to exceed 1 percent. Small mammals will be relocated to the nearest suitable habitat outside of the construction area to minimize stress associated with the relocation, and to ensure that diseases and/or parasites are not carried to another population.

In addition to small mammal trapping and relocation (BIO-15), the following measures described in Section 4 are proposed to avoid or minimize potential take of the Nelson's antelope squirrel: Terrestrial Wildlife Pre-Construction Survey (BIO-4), Worker Education Program (BIO-7), Operations and Maintenance Activities (BIO-8), and Ground Disturbance Monitoring for Terrestrial Wildlife (BIO-16). These mitigation measures will minimize vehicle strikes, construction-related food or trash concerns, and off-road vehicle activity. As described in measure BIO-7, open trenches will be covered if left overnight, and pipe storage will only occur within identified, secured construction areas. Direct impacts to Nelson's antelope squirrels are not likely to involve more than ten individuals over the life of the Project, due to the size and duration of the Project, and the population density in the affected area. All mitigation measures for the Nelson's antelope squirrel are discussed in more detail in Section 4 and Section 5. Potential incidental take of Nelson's antelope squirrel will be fully mitigated by implementation of these measures.

3.2.4 San Joaquin Kit Fox

San Joaquin kit fox have been observed along the CO₂ pipeline south of the California Aqueduct (Figure 9) but no sign, active dens, or road-killed fox have been observed north of the Aqueduct during surveys conducted for the Project over the last 5 years. However, this species has been previously documented on the valley floor, and portions of the Project overlap with the Western Kern County Core recovery area for the fox (Figures 9 and 10).

San Joaquin kit fox has the potential to be directly impacted by vehicle strikes, entrapment in open trenches, and/or entombment within a burrow during the installation and maintenance of the Project pipelines. San Joaquin kit fox may become trapped in pipes, or injured or killed by predators attracted to construction-related food or trash at the Project Site. Portions of the CO₂ pipeline and process water pipeline are located within the Western Kern County Core recovery area identified in the 1998 USFWS recovery plan (USFWS 1998), and shown on Figure 10. The

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Project will temporarily disturb or remove habitats in these areas that are already degraded by existing activities (i.e., dirt roads, active agriculture, and canals), and are not likely to provide habitat for breeding or denning kit foxes. The portion of the Western Kern County Core recovery area impacted by the process water pipeline is generally poor habitat for denning, foraging, and dispersal due to the substantial level of existing disturbance (i.e., graded dirt roads, agricultural canals, and actively farmed lands), and proximity to other types of human disturbance (i.e., dumping, target shooting, and spraying).

Vehicle strikes of San Joaquin kit fox are the most probable manner in which the Project will injure or kill an individual. Table 3 (Existing and HECA Project-Related Traffic Estimates within the San Joaquin Kit Fox Recovery Area) and Table 4 (HECA Project Construction and Operations Traffic Impact to San Joaquin Kit Fox) summarize expected traffic and potential San Joaquin kit fox mortality.

The existing mortality of San Joaquin kit fox in the western Bakersfield area was determined based on the 6-year study Urban Roads and the Endangered San Joaquin Kit Fox, by Bjurlin, Cypher, Wingert, and Van Horn Job (2005). Existing, construction, and operations traffic levels were determined using Section 5.10 of the Amended AFC (Hydrogen Energy California, 2012), and Caltrans traffic estimates. Based on known mortality rates and traffic levels, the HECA Project-related mortality of San Joaquin kit fox is estimated at approximately 39 foxes over the course of 25 years (Table 4). This is a conservatively high estimate because the time of day during which the increased traffic will be on the road was not considered in the estimate. Kit foxes tend to travel during the evenings, at night, or near dawn, but approximately 66 percent of the Project-related traffic will be on the roads during daylight hours when kit fox are less likely to be present (URS 2012).

The following measures are described in Section 4 that will avoid or minimize potential take of the San Joaquin kit fox: Terrestrial Wildlife Pre-Construction Survey (BIO-4), Worker Education Program (BIO-7), Operations and Maintenance Activities (BIO-8), and Ground Disturbance Monitoring for Terrestrial Wildlife (BIO-16). In addition, removal of inactive or potential San Joaquin kit fox dens is proposed (BIO-14) to avoid direct effects to an active natal den, including harm of individual foxes.

These measures will identify and avoid special-status terrestrial wildlife species in the Project Area, minimize vehicle strikes, minimize construction-related food or trash concerns, and restrict off-road vehicle activity. As described in measure BIO-7, open trenches will be covered if left overnight. The combination of potential traffic-related impacts summarized above and other potential take of San Joaquin kit fox identified in this section is estimated to affect approximately 39 individuals over the 25-year life of the Project, or approximately 1.5 individuals per year. This impact represents an annual loss of about 0.4 to 3 percent of the adult kit fox population of 46 to 363 individuals documented by Warrick and Harris from the Elk Hills region between 1983 and 1995 (Warrick and Harris, 2001). It is expected that impacts to San Joaquin kit fox will be fully mitigated by the mitigation measures described in Section 4, and the habitat compensation provided in Section 5. Potential incidental take of San Joaquin kit fox will be fully mitigated by implementation of these measures.

Table 3
Existing and HECA Project-Related Traffic Estimates
within the San Joaquin Kit Fox Recovery Area

Roadway	Current ADT ¹	Construction		Operations ²		Product Deliveries ³	
		Current + Project ADT	Project Increase	Current + Project ADT	Project Increase	Current + Project ADT	Project Increase
I-5 (north of SR 46)	30,500	30,759	0.8%	30,876	1.2%	30,702	0.7%
I-5 (south of SR 119)	30,000	30,396	1.3%	30,416	1.4%	30,226	0.8%
Tupman Road (Tupman Town) ⁴	490	1,474	200.8%	614	25.3%	490	0.0%
SR 119 (Bakersfield – east of I-5)	6,800	7,554	11.1%	6,918	1.7%	6,822	0.3%
SR 119 (Taft – west of Tupman Road)	11,800	11,924	1.1%	11,816	0.1%	11,800	0.0%
Stockdale Highway (west of I-5) ⁴	2,520	3,683	46.2%	3,504	39.0%	4,321	71.5%
SR 46 (west of I-5)	10,000	10,136	1.4%	10,000	0.0%	10,000	0.0%

Notes:

- ¹ Unless otherwise stated, ADT values were obtained from Caltrans 2010 Traffic Data.
- ² HECA Project employees or by product trucks only.
- ³ Petcoke and coal delivery to the HECA Project Site by truck only. (Does not include employees or product trucks.)
- ⁴ Calculated from 2012 peak hour counts assuming that PM peak hour equates to 10% of ADT.

ADT = average daily traffic

SR = State Route

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**Table 4
HECA Project Construction and Operations Traffic Impact to San Joaquin Kit Fox**

Roadways	Length (miles)	San Joaquin kit fox Recovery Area	Type	Baseline take (fox/yr/mi)	Baseline annual take (fox/year)	Project vehicles (% increase)	Project Take (fox/yr)	Cumulative Take (fox/yr)
Construction								
I-5 (north of SR 46)	14.00	Antelope Plain/ Semitropic/Kern	Satellite	0.01 ¹	0.14	0.8	0.00	0.14
I-5 (south of SR 119)	5.65	Western Kern County	Core	0.03 ¹	0.17	1.3	0.00	0.17
Tupman Road (Tupman Town)	5.41	Western Kern County	Core	0.14 ²	0.76	200.8	1.53	2.29
SR 119 (Bakersfield – east of I-5)	4.28	Western Kern County	Core	0.07	0.30	11.1	0.00	0.30
SR 119 (Taft – west of Tupman Road)	13.22	Western Kern County	Core	0.02 ¹	0.26	1.1	0.00	0.26
Stockdale Highway (west of I-5)	5.09	Urban Bakersfield	Satellite	0.20 ¹	1.02	46.2	0.47	1.49
SR 46 (west of I-5)	10.5	Antelope Plain/ Semitropic/Kern	Satellite	0.06 ⁴	0.63	1.4	0.01	0.64
SR 46 (west of I-5)	6.75	Link	Link	0.03 ⁴	0.20	1.4	0.00	0.20
SR 46 (west of I-5)	10.18	Link	Link	0.03 ⁴	0.30	1.4	0.00	0.30
Subtotal				0.59	3.78		2.01	5.79
Construction-related take over 3 years							6.03	

Table 4
HECA Project Construction and Operations Traffic Impact to San Joaquin Kit Fox (Continued)

Roadways	Length (miles)	San Joaquin kit fox Recovery Area	Type	Baseline take (fox/yr/mi)	Baseline annual take (fox/year)	Project vehicles (% increase)	Project Take (fox/yr)	Cumulative Take (fox/yr)
Operations								
I-5 (north of SR 46)	14.00	Antelope Plain/ Semitropic/Kern	Satellite	0.01 ¹	0.14	1.2	0.00	0.14
I-5 (south of SR 119)	5.65	Western Kern County	Core	0.03 ¹	0.17	1.4	0.00	0.17
Tupman Road (Tupman Town)	5.41	Western Kern County	Core	0.14 ²	0.76	25.3	0.19	0.95
SR 119 (Bakersfield – east of I-5)	4.28	Western Kern County	Core	0.07	0.30	1.7	0.01	0.31
SR 119 (Taft – west of Tupman Road)	13.22	Western Kern County	Core	0.02 ¹	0.26	0.1	0.00	0.26
Stockdale Highway (west of I-5)	5.09	Urban Bakersfield	Satellite	0.20 ¹	1.02	39.0	0.40	1.42
Subtotal				0.40	2.65		0.60	3.25
Operations-related take over 25 years							15.00	

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Table 4
HECA Project Construction and Operations Traffic Impact to San Joaquin Kit Fox (Continued)

Roadways	Length (miles)	San Joaquin kit fox Recovery Area	Type	Baseline take (fox/yr/mi)	Baseline annual take (fox/year)	Project vehicles (% increase)	Project Take (fox/yr)	Cumulative Take (fox/yr)
Product Delivery								
I-5 (north of SR 46)	14	Antelope Plain/ Semitropic/Kern	Satellite	0.01 ¹	0.14	0.7	0.00	0.14
I-5 (south of SR 119)	5.65	Western Kern County	Core	0.03 ¹	0.17	0.8	0.00	0.17
SR 119 (Bakersfield – east of I-5)	4.28	Western Kern County	Core	0.07	0.30	0.3	0.00	0.30
Stockdale Highway (west of I-5)	5.09	Urban Bakersfield	Satellite	0.2	1.02	71.5	0.73	1.75
Subtotal				0.31	1.63		0.73	2.36
Coal/Petcoke-related take over 25 years⁴								
Total Project-related take over 25 years							18.25	
							39.28	

Notes:

- ¹ Mortality calculated from data presented in: esrp.csustan.edu/publications/pdf/esrp_urbanroad_sjktf.pdf.
- ² Mortality estimated based on road type described in: esrp.csustan.edu/publications/pdf/esrp_urbanroad_sjktf.pdf.
- ³ Baseline take for SR 46 was estimated based on home range size from <http://humboldt-dspace.calstate.edu/xmlui/bitstream/handle/2148/36/Frost.pdf?sequence=1> compared to “urban” kit fox. Link populations were assumed to be half of the satellite population.
- ⁴ Traffic-related impacts associated with operation and product deliveries will be reduced if coal is transported to the Project Site using the proposed rail spur.

I-5 = Interstate 5

SR = State Route

3.2.5 Swainson's Hawk

Informal surveys conducted in 2010 and 2011, as well as a protocol level survey in 2012, identified three distinct Swainson's hawk nesting areas in the vicinity of the Project Site and Project linears. Figure 11 identifies the locations of all Swainson's hawk nest sites identified in the Project study area and vicinity.

Swainson's hawks could be directly impacted by removal of nesting and foraging habitat. Construction disturbance during the breeding season could cause incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment; and eggs or nestlings could be injured or killed by predators attracted to construction-related food or trash at the Project Site.

Project Site

Surveys completed in 2010 and 2011 located probable Swainson's hawk nests within a mile of the Project Site boundary in the Tule Elk Preserve. Protocol-level surveys in 2012 confirmed a successful Swainson's hawk nest in this area (Nest #22), based on observations of two recent fledglings. Direct disturbance to this nesting site is unlikely, because the site is 0.7 mile from the Project boundary.

Natural Gas and Industrial Rail Line

Swainson's hawk Nest #29 was identified and confirmed as occupied in 2012. This nest is located within 1/4 mile of both the natural gas line and the Industrial Railroad Line. Increased noise and/or light associated with construction of the natural gas linear are not likely to disturb nesting Swainson's hawks at this location, because implementation of BIO-13 requires that most of the construction-related impacts will be concentrated in the non-breeding months. Additional disturbances will include increased rail traffic on the existing rail line approximately 300 feet north of the nest structure.

Process Water Line

Four Swainson's hawk nests (Nest 6, 5, 19, and 21) were confirmed along a stretch of the KR FCC near the process water pipeline in 2012. Potential disturbances will include increased noise and human disturbance associated with construction of the process water pipeline, although BIO-13 requires most of the construction-related activities to occur during the non-breeding months. Direct disturbance to these nesting sites is unlikely, because the nest sites are over 1,000 feet from the process water line, and separated by the levees of the KR FCC.

The following measures described in Section 4 are proposed to avoid or minimize potential take of Swainson's hawk: Worker Education Program (BIO-7), Operations and Maintenance Activities (BIO-8), and Swainson's hawk Avoidance and Minimization (BIO-13). These mitigation measures will minimize construction-related food and/or trash concerns, and will restrict construction-related activities to the non-breeding season. The avoidance and minimization measures for the Swainson's hawk are discussed in more detail in Section 4; and additional habitat compensation is described in Section 5. Potential incidental take of Swainson's hawks will be fully mitigated by implementation of these measures.

3.3 JEOPARDY ASSESSMENT

Based on the evaluation of species impacts presented above, the HECA Project and OEHI Project will not cause a significant decline in the regional population trend, or increase the known threats to these species. Additionally, there are no other known related projects or activities.

None of the listed species addressed in this Incidental Take Permit (ITP) application will be adversely impacted to the extent that the continued existence of the species will be jeopardized. This assessment is based on the following reasons:

1. None of the sensitive species described herein have population distributions limited to the footprint of the projects.
2. No core populations will be removed by the implementation of the projects.
3. For all of the species described, the implementation of these projects will not result in the removal or mortality to a significant portion of the population.
4. The implementation of these projects and the associated minimization measures will not exacerbate or promote the occurrence of known threats to the species.
5. There are no reasonably foreseeable impacts on the species included herein from other related projects or activities.

4.0 PROPOSED AVOIDANCE, AND MINIMIZATION MEASURES

This section describes the measures that are proposed to avoid and minimize potential take of California-listed species and their habitats. The design of the HECA Project and OEHI Project has been refined in coordination with the resource agencies and environmental specialists to avoid and minimize impacts on sensitive biological resources to the extent practicable; these modifications are described in more detail below. These conservation measures are extracted from the Amended AFC submitted to the CEC in May 2012, and the corresponding numbers or mitigation measures from the Amended AFC (e.g., BIO-1, BIO-2, etc.) are provided where applicable.

The HECA Project and OEHI Project designs have been modified to incorporate additional avoidance, minimization, and conservation measures. These measures include relocating the HECA Project Site from the originally proposed location to its current location north of the California Aqueduct to reduce impacts to the blunt-nosed leopard lizard; and relocating the natural gas pipeline to avoid portions of the Coles Levee Ecosystem Preserve. In addition, the potable water linear and electrical transmission linear were shortened and relocated to the east of the HECA Project Site, which avoided impacts to 1.9 acres of Allscale Scrub habitat. Proposed CO₂ pipeline crossings of the Outlet Canal, the KRFCC, and the California Aqueduct will be constructed using HDD to avoid direct and indirect effects to species movement and dispersal at these locations.

4.1 GENERAL MITIGATION MEASURES

HECA will implement the following general measures to avoid and minimize potential adverse effects to special-status biological resources. The OEHI Project will implement the avoidance and minimization measures in the 1995 Biological Opinion issued by the USFWS and 1997 MOU between OEHI and the CDFW, as amended in 1999 and 2010.

BIO-4 — Terrestrial Wildlife Pre-Construction Survey

Pre-construction surveys will be conducted in affected areas that have ruderal or natural habitats that are potentially suitable habitat for blunt-nosed leopard lizard, San Joaquin kit fox, giant kangaroo rats, and Tipton's kangaroo rats. Surveys will be conducted less than 2 weeks prior to the start of ground disturbance within the affected areas and adjacent habitats within 200 feet of the affected areas, or to the property boundary if less than 200 feet, and permission from the adjacent landowner cannot be obtained. Efforts will include visual surveys for blunt-nosed leopard lizard, San Joaquin kit fox, giant kangaroo rats, and Tipton's kangaroo rats. Visual surveys will also be conducted for Buena Vista Lake ornate shrew in areas within the process water pipeline construction limits that are adjacent to the West Side Canal and the KRFCC.

All sightings and/or signs of sensitive wildlife will be mapped using a global positioning system device. The results of all pre-construction surveys will be documented, and submitted to the CEC, USFWS, and CDFW (see mitigation measure BIO-17).

BIO-5 – Site Clearance Prior to Ground Disturbance

Prior to ground-disturbing activities in undeveloped and uncultivated lands within the HECA Project area, surveys will be conducted to determine whether San Joaquin kit fox, small mammals, or blunt-nosed leopard lizards are present. To ensure that no blunt-nosed leopard lizards are taken during the initial site preparation, each area with potential habitat will be surveyed by a CEC-approved biologist according to the standard protocols for survey timing and ambient temperature. These surveys will occur prior to any ground disturbance. Exclusion fencing will be installed around the perimeter of the work area to ensure that no wildlife re-enters. Exclusion fencing will consist of tin flashing (or other material approved by CDFW and USFWS) that will be buried at least 9 inches underground, and rise at least 2 feet above the ground.

Once the exclusion fencing has been established, the area will be visually surveyed during the day for wildlife, and small mammals will be trapped and relocated (see conservation measure BIO 15) during the night. All surveying and trapping efforts will be conducted in a manner that minimizes collapsing any small mammal burrows. Tracking stations will be used to determine whether there are additional individuals in the area.

The HECA Project construction areas will be surveyed daily for blunt-nosed leopard lizards when soil and air temperatures are within CDFW survey protocol limits. An area will be deemed clear of any blunt-nosed leopard lizards after there have been no signs or sightings for 5 survey days. If a blunt-nosed leopard lizard is observed within the construction area, the exclusion fencing will be opened to allow the lizard to leave on its own accord. Once the lizard has left the area, the exclusion fencing will be closed and surveyed until there are no signs or sightings of blunt-nosed leopard lizards for 5 consecutive days.

Exclusion fencing will be left in place only for as long as needed to complete the work. For installation of the Project linears, no one area is likely to be closed for more than 6 months. The fencing will be inspected and maintained daily by the approved biologist. If the exclusion fencing is compromised (by wind or other means) and left open, an approved biologist will repair the fencing and determine if the area will need to be re-surveyed and/or re-trapped for wildlife.

To confirm that BIO 5 is successful, ground disturbance will be monitored (see measure BIO 16).

The results of the blunt-nosed lizard surveys and area clearance will be documented, and submitted to the CEC, USFWS, and CDFW (see measure BIO 17).

BIO-7 — Worker Education Program

A worker education program will be implemented for all construction personnel, regular drivers, and operation personnel. All personnel will be required to read an educational brochure and attend an education class given by a qualified biologist. The brochure and class will describe the special-status species that could be encountered, the regulatory

protection of the species, and appropriate measures to take upon discovery of a special-status species or active bird nest.

Site personnel will be instructed to set equipment off the ground when possible to minimize access to small mammals. All work areas will be kept clear of trash and food items to minimize attracting wildlife. Construction techniques to minimize potential adverse impacts will also be presented, such as filling or covering excavations. If excavations are to be left open overnight, ramps will be installed to allow wildlife to escape.

The names and affiliations of all people trained will be documented, and submitted to the CEC, USFWS, and CDFW (see mitigation measure BIO-17).

BIO-8 — Operations and Maintenance Activities

The worker education program will be implemented for operations and maintenance activities along the Project linears (i.e., access road, transmission lines). Personnel will be instructed to be alert to and aware of the presence of special-status wildlife. If any special-status wildlife are spotted, activities will be conducted in a manner that will allow the animal(s) to safely move away from the activity area.

4.2 SPECIES SPECIFIC MEASURES

BIO-13 — Swainson's Hawk Avoidance and Minimization

The following avoidance and minimization measures have been developed using the information contained in the "Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley" by the Swainson's Hawk Technical Advisory Committee, dated May 31, 2000.

Where possible, major ground disturbance will be scheduled to occur between August 1 and December 31 at the Project Site when the hawks are not in the area. The Project Site and a 0.5-mile buffer will be surveyed weekly between late February and April 20 to determine whether any hawks are nesting in the area. If any nests are found, they will be monitored through the breeding season to determine if the ongoing work is affecting the pair. If there appear to be any adverse effects, the CEC and CDFW will be contacted to address the potential impact. No new ground disturbance will occur within 0.5 mile of an active Swainson's hawk nest without concurrence from the CEC and CDFW.

Where possible, work along all linears will occur when Swainson's hawks are absent: between August 1 and December 31. Work between January 1 and March 1 will continue with periodic biological monitoring. If work to linears is required during the time period of March 1 to July 30, surveys will be conducted out to 1 mile from the work zone prior to initiation of work. If no sign of Swainson's hawk breeding is observed within 0.5 mile of the work zone (including laydown and staging areas) after four surveys, work will be permitted. Additional surveys will be conducted for as long as the

work continues; if nesting is detected, work will be halted while CEC and CDFW are consulted.

The results of all pre-construction surveys will be documented and submitted to the CEC, USFWS, and CDFW (see mitigation measure BIO-17).

BIO-14 — San Joaquin Kit Fox Mitigation

Disturbance (including any excavation and/or destruction) to all San Joaquin kit fox dens shall be avoided to the maximum extent possible, and shall only occur in accordance with the protocol described in the Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance (USFWS, 2011), or as approved by the wildlife agencies. In essence, the following hierarchy shall be adhered to:

1. Preconstruction surveys shall be conducted no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities or any Project activity likely to impact the San Joaquin kit fox. Surveys shall identify kit fox habitat features on the Project Site, and evaluate use by kit fox; and if possible, assess the potential impacts to the kit fox by the proposed activity. The status of all dens will be determined and mapped, and all appropriate equipment exclusion zones (per den type) will be demarcated in a manner that sufficiently alerts Project equipment operators of the exclusion zone.
2. Regardless of time of year, no natal kit fox dens will be excavated unless authorized by the Wildlife Agencies. Other den types may be excavated only by agency-approved biologists, and only after occupancy status has been determined. Excavation and/or destruction of dens will then be allowed in accordance with the procedures specified in Standardized Recommendations (USFWS, 2011), or as approved by the wildlife agencies.
3. All known and natal kit fox dens that are slated for destruction will be replaced. Prior to destruction of an active den, artificial replacement dens will be constructed outside the Project buffer zone. Replaced dens will be constructed according to protocols set forth by the Wildlife Agencies. The replacement ratio will be 1:1 for non-natal dens. If excavation or destruction is approved by the Wildlife Agencies, replacement ratios will be 2:1 for natal dens.

The results of all den assessments, burrow scoping, and excavation activities will be documented, and submitted to the CEC, USFWS, and CDFW (see mitigation measure BIO-17).

BIO-15 — Small Mammal Mitigation

Construction work areas within natural or ruderal habitats will be surveyed and small mammals will be relocated as necessary prior to any ground disturbance to minimize impacts to small mammals during the initial site preparation; work areas will be cleared in accordance with the *Survey Protocol for the Morro Bay Kangaroo Rat* (USFWS and CDFG, 1996), or as determined in consultation with either CDFW or USFWS. Areas

will be secured prior to this effort so that wildlife species cannot re-enter the area (in conjunction with conservation measure BIO-5).

Small mammal trapping and relocation will be conducted for 5 consecutive nights, or until no animals are caught on 2 consecutive nights per area. The small mammal trapping surveys will occur within the construction work areas in potentially suitable habitat (alkali desert scrub, pasture, annual grassland, and barren) that contains evidence of small mammals. Traps will be set according to “sign” (burrows, trails, scat, etc.) and/or in areas of high habitat quality. Small mammal trapping and relocation will be performed by a qualified biologist(s) approved by the CEC with the necessary permits. To minimize mortality associated with relocation, trapped individuals would be relocated to the closest suitable habitat where access is available. The results of the small mammal trapping and area clearance will be documented, and submitted to the CEC, USFWS, and CDFW (see mitigation measure BIO-17).

BIO-16 — Ground Disturbance Monitoring for Terrestrial Wildlife

Construction activities in natural or ruderal habitats with habitat value for listed species will be monitored by a qualified biologist(s) while the top 18 inches of soil are initially disturbed. The qualified biologist will be approved by the CEC as specified in Measure BIO-17. The biologist(s) will watch for any special-status animals and will have the authority to stop work if a listed wildlife species is encountered in the construction area. If authorized to remove and/or relocate the species, biologists will relocate the animal to the nearest safe location. If the species cannot be legally relocated, work at that location will be shut down and all personnel will be required to leave the area. The approved biologist will watch the wildlife in question from a distance until the individual has left the area. The results of all construction monitoring will be documented, and submitted to the CEC, USFWS, and CDFW (see mitigation measure BIO-17).

4.3 MONITORING AND MITIGATION REPORTING

BIO-17 — Reporting to Agencies

During construction, a quarterly Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP) report will be prepared by HECA and submitted to the CEC, CDFW, and USFWS. The report will be submitted by the 20th of the following month (i.e., the report for May will be submitted by June 20). If the 20th falls on a weekend or holiday, the report will be due the first business day following the 20th. To reduce the use of paper, the BRMIMP may be submitted on compact disc (CD) or electronically, as directed by each agency.

During construction at the HECA Project Site, a qualified biologist approved by the CEC will examine active work areas every day prior to the onset of activities to ensure that no special-status species are in the area, and that all wildlife barriers are still in place. Biologists will inform the construction crews when areas are clear, and report significant observations of wildlife to the agencies, as required in the BRMIMP.

HYDROGEN ENERGY CALIFORNIA INCIDENTAL TAKE PERMIT APPLICATION

CEC-approved biologists would meet the following minimum criteria:

1. Hold a bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field,
2. Have at least three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society,
3. Have at least one year of field experience with biological resources found in or near the Project area, and
4. Meet any additional CDFW requirements for approved biological monitors.

In lieu of requirements 1 through 3 above, the biologist's resume shall demonstrate to the satisfaction of the CEC Compliance Project Manager (CPM), in consultation with CDFW, that the proposed biological monitor has the appropriate training and background to effectively implement the requirements specified in the applicable Avoidance, Minimization, and Compensation measures.

5.0 HABITAT COMPENSATION

HECA and OEHI will compensate for permanent loss of habitat at a ratio established in consultation with the USFWS and CDFW. Approved mitigation banks or approved land purchases will be used to replace habitat that is permanently lost. Compensation will be selected that has habitat suitable for the majority of species impacted and that will protect the species and the associated habitat in perpetuity. Documentation of the proposed compensation, including executed agreements, or funding assurances for acquisition and long-term management, will be provided to CDFW prior to the start of ground disturbing activities.

5.1 HECA PROJECT HABITAT MITIGATION

HECA will compensate for the permanent and temporary loss of habitats potentially used by state-listed species by acquiring credits from the CDFW-approved Kern Water Bank Authority mitigation bank. The purchase of mitigation credits would occur prior to initiation of the proposed action.

HECA LLC will acquire CDFW-approved mitigation credits that meet the habitat and/or species requirements of the state-listed species that will be affected by the proposed action. The compensation proposal consists of the following components:

- Compensation for temporary habitat loss associated with construction of the natural gas pipeline: a total of 8.0 acres (credits) will be acquired to compensate for 3.7 acres of natural vegetation that will be temporarily removed during construction.
- Compensation for permanent habitat loss associated with construction of the Project Site, the railroad spur, the natural gas pipeline, and the PG&E switching station: a total of 47 acres (credits) will be acquired to compensate for the permanent loss of 466 acres of cultivated fields that may be used infrequently by San Joaquin kit fox for movement and migration.

To compensate for the loss of 466 acres of cultivated fields that are potentially used by foraging Swainson's hawks, HECA will continue to promote active cultivation within the Controlled Area to provide suitable foraging habitat for the Swainson's hawk. In addition, four stands of five trees each (e.g., Fremont cottonwood or other native trees capable of growing to 30 feet tall or higher) will be planted within the Controlled Area to provide future Swainson's hawk nest sites.

5.2 OEHI PROJECT HABITAT MITIGATION

OEHI will provide compensation for the OEHI Project, including the CO₂ pipeline, in accordance with the 1995 USFWS Biological Opinion concerning oil production at Maximum Efficient Rate on Elk Hills Naval Petroleum Reserve (USFWS File # 1 1 95 F 102) and the 1997 Memorandum of Understanding and Take Authorization between OEHI and the California Department of Fish and Wildlife (CDFW Incidental Take Authorization No. 2081-1997-000-04).

**HYDROGEN ENERGY CALIFORNIA
INCIDENTAL TAKE PERMIT APPLICATION**

6.0 CERTIFICATION

I certify that the information submitted in this application is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to suspension and revocation of this permit and to civil and criminal penalties under the laws of the State of California.

 5/2/2013
Date

James L. Croyle
CEO, Hydrogen Energy California, LLC

(b) **Information requirements;** consultation with Department. Responses to the requirements of section 783.2(a)(5)-(a)(9) shall be based on the best scientific and other information that is reasonably available. At an applicant's request, the Department shall, to the greatest extent practicable, consult with the applicant regarding the preparation of a permit application in order to ensure that it will meet the requirements of this article when submitted to the Department. An analysis prepared pursuant to state or federal laws other than CESA that meets the requirements of section 783.2 and 783.3 may be submitted in an incidental take permit application.

7.0 REFERENCES

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HYDROGEN ENERGY CALIFORNIA INCIDENTAL TAKE PERMIT APPLICATION

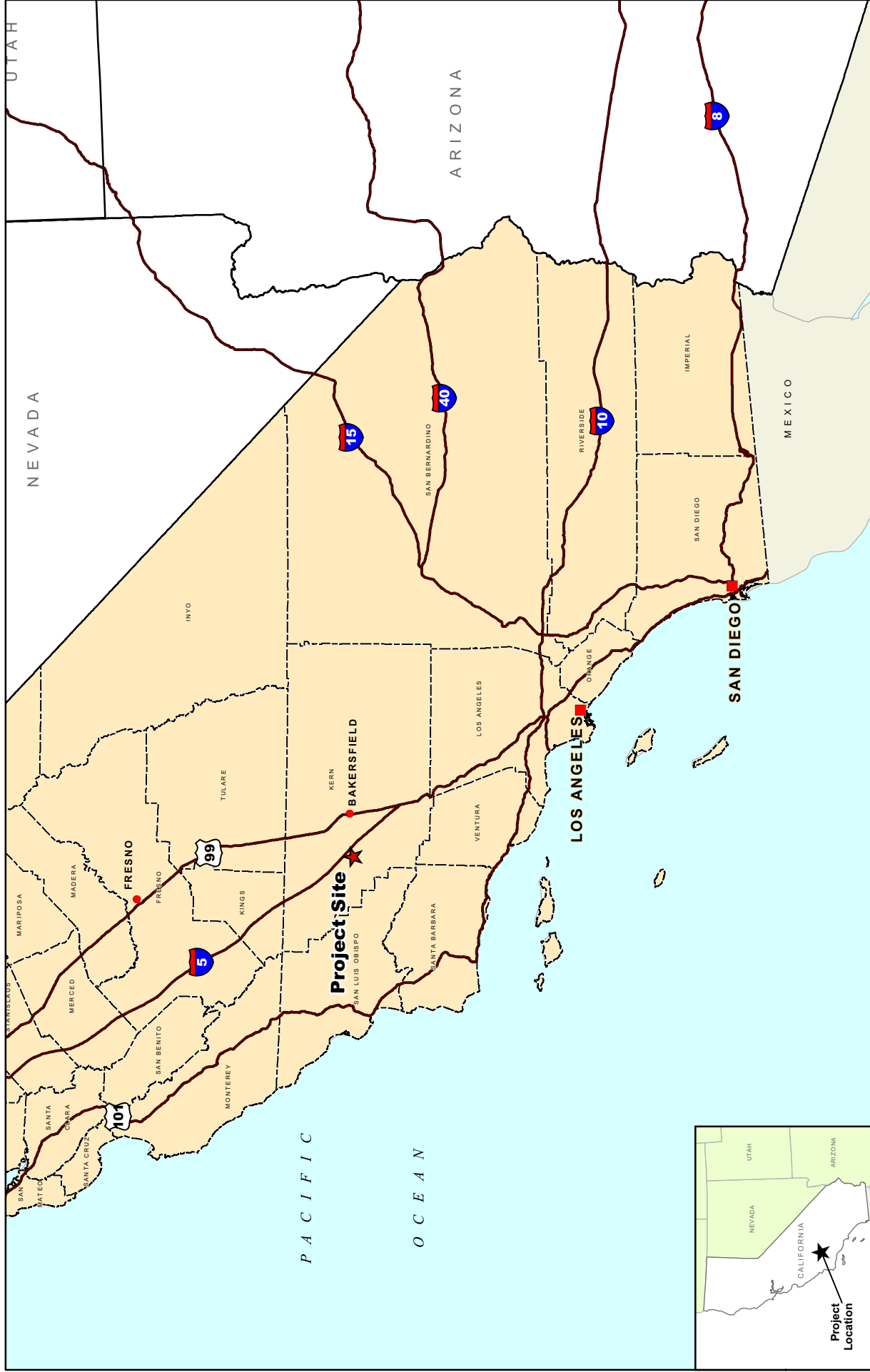
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- Major Cities
- Minor Cities
- Major Highways
- ▭ State Boundaries
- - - County Boundaries



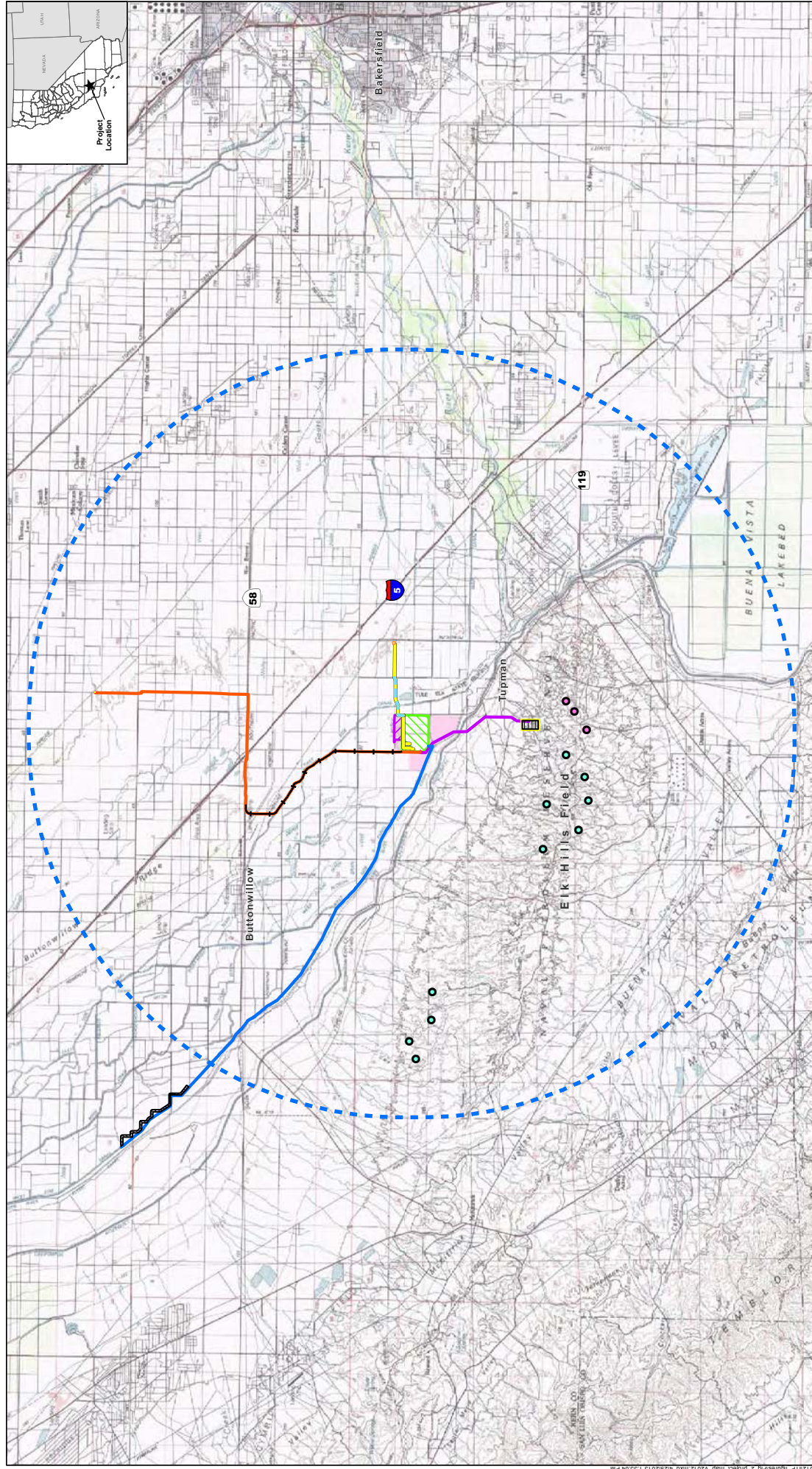
PROJECT LOCATION

April 2013
28068052

Incidental Take Permit
Hydrogen Energy California (HECA)
Kern County, California



FIGURE 1



PROJECT VICINITY

Incidental Take Permit

Hydrogen Energy California (HECA)

Kern County, California

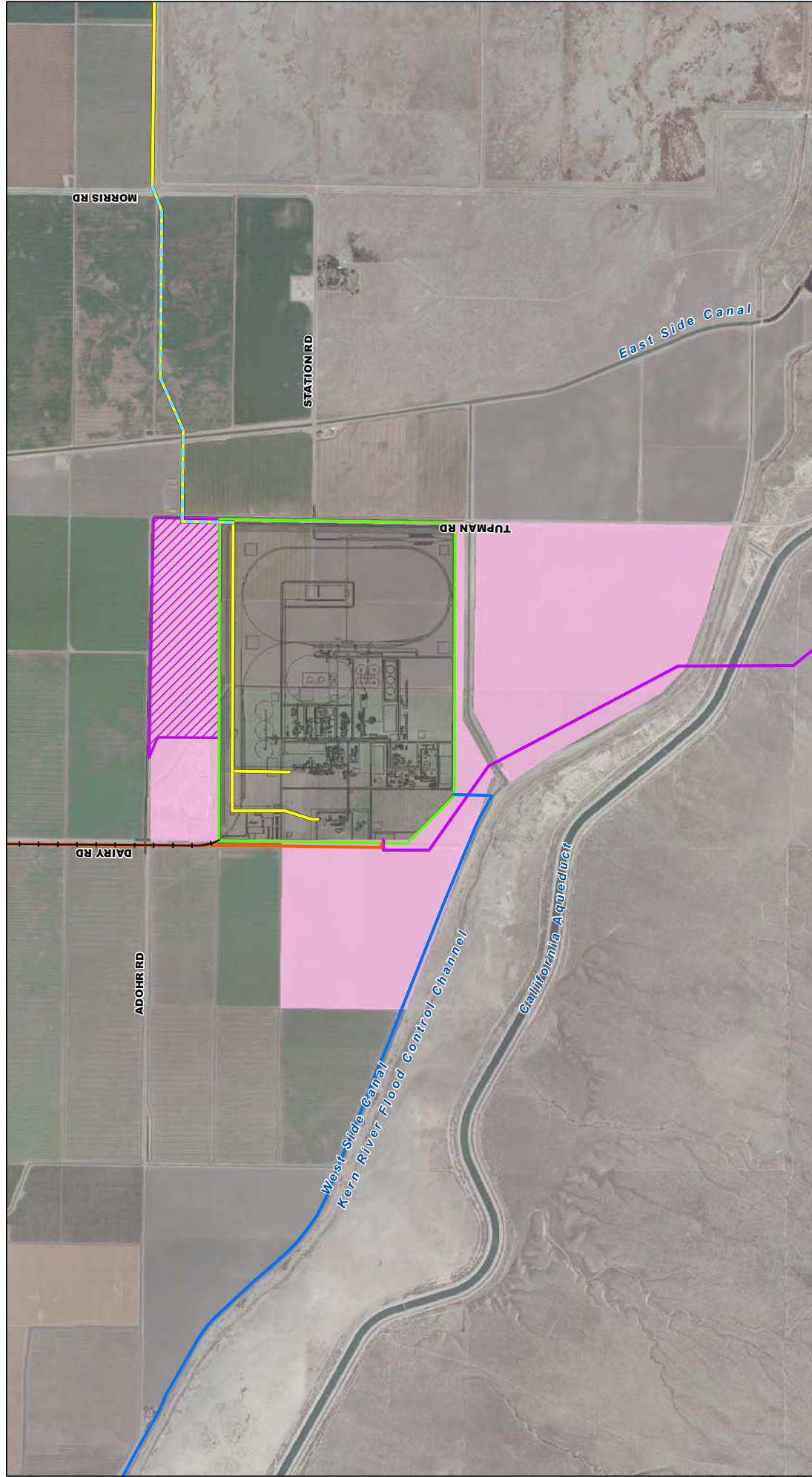
April 2013

28068052

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FIGURE 2

Sources: USGS 30' x 60' quads; T-11 1982; Delano 1982; Created using TOPOI, CO2008 National Geographic Maps, All Rights Reserved. HECA Project Team (Biological Data, 2009)



<div data-bbox="1291 1984 1307 2039" data-label="Image"></div> <div data-bbox="1291 1921 1307 1984" data-label="Text">Project Site</div>	<div data-bbox="1291 1816 1307 1984" data-label="Image"></div> <div data-bbox="1291 1753 1307 1816" data-label="Text">Construction Staging Area</div>	<div data-bbox="1291 1669 1307 1816" data-label="Image"></div> <div data-bbox="1291 1606 1307 1669" data-label="Text">Carbon Dioxide</div>
<div data-bbox="1323 1984 1339 2039" data-label="Image"></div> <div data-bbox="1323 1921 1339 1984" data-label="Text">Controlled Area</div>	<div data-bbox="1323 1816 1339 1984" data-label="Image"></div> <div data-bbox="1323 1753 1339 1816" data-label="Text">Potable Water</div>	<div data-bbox="1323 1669 1339 1816" data-label="Image"></div> <div data-bbox="1323 1606 1339 1669" data-label="Text">Process Water</div>
<div data-bbox="1356 1984 1372 2039" data-label="Image"></div> <div data-bbox="1356 1921 1372 1984" data-label="Text">Transmission</div>	<div data-bbox="1356 1816 1372 1984" data-label="Image"></div> <div data-bbox="1356 1753 1372 1816" data-label="Text">Railroad</div>	<div data-bbox="1356 1669 1372 1816" data-label="Image"></div> <div data-bbox="1356 1606 1372 1669" data-label="Text">Transmission</div>

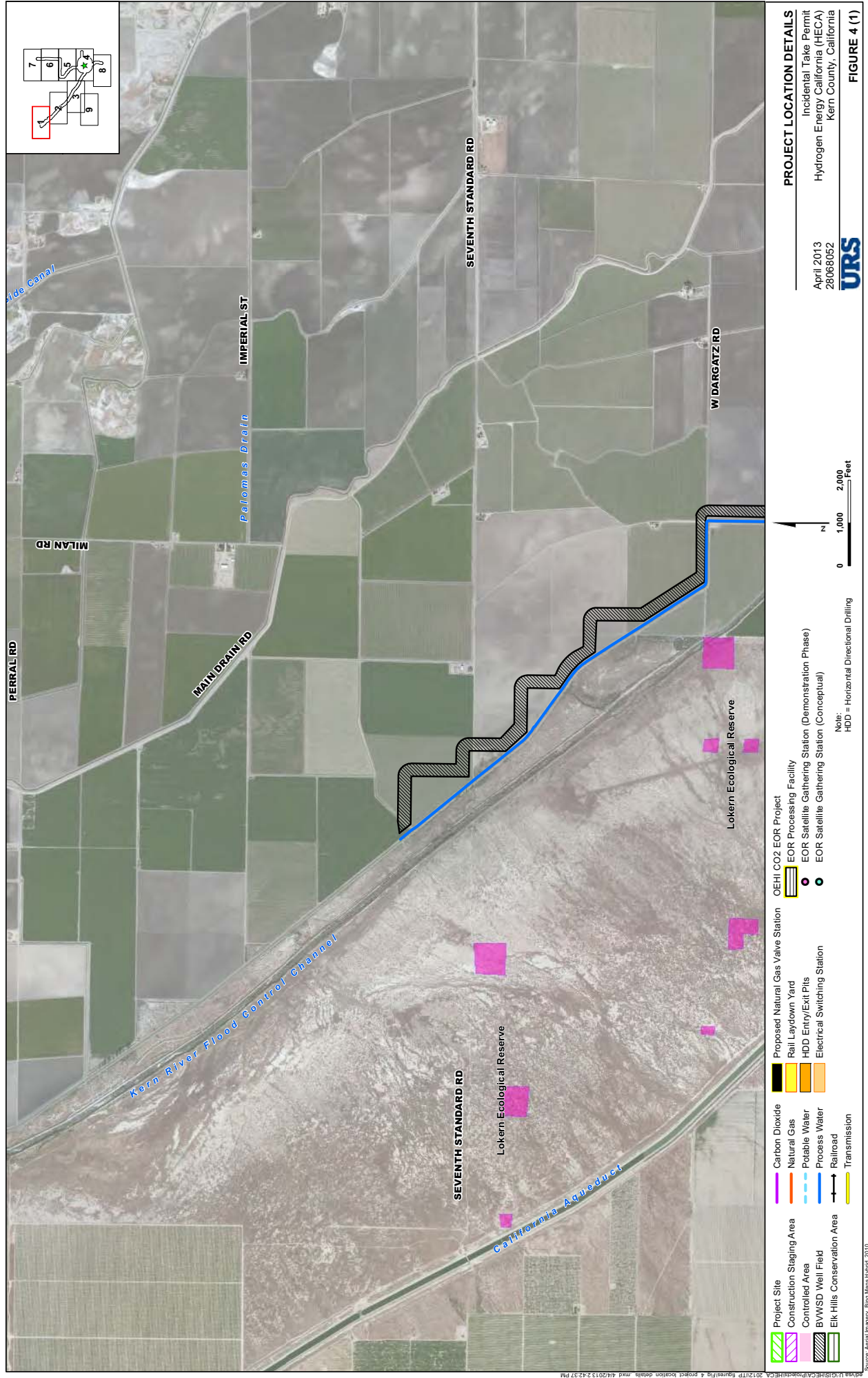
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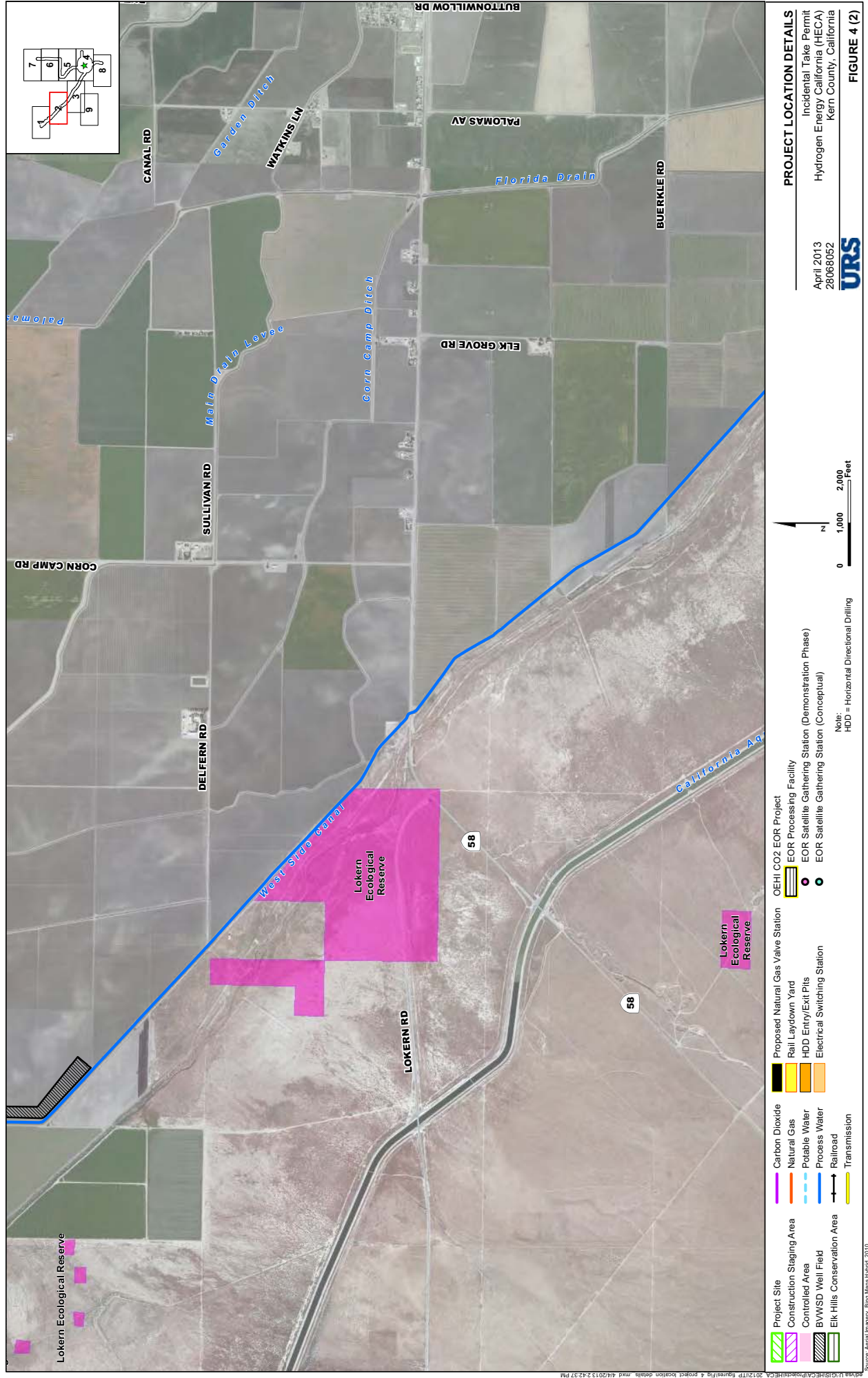
PROJECT SITE MAP

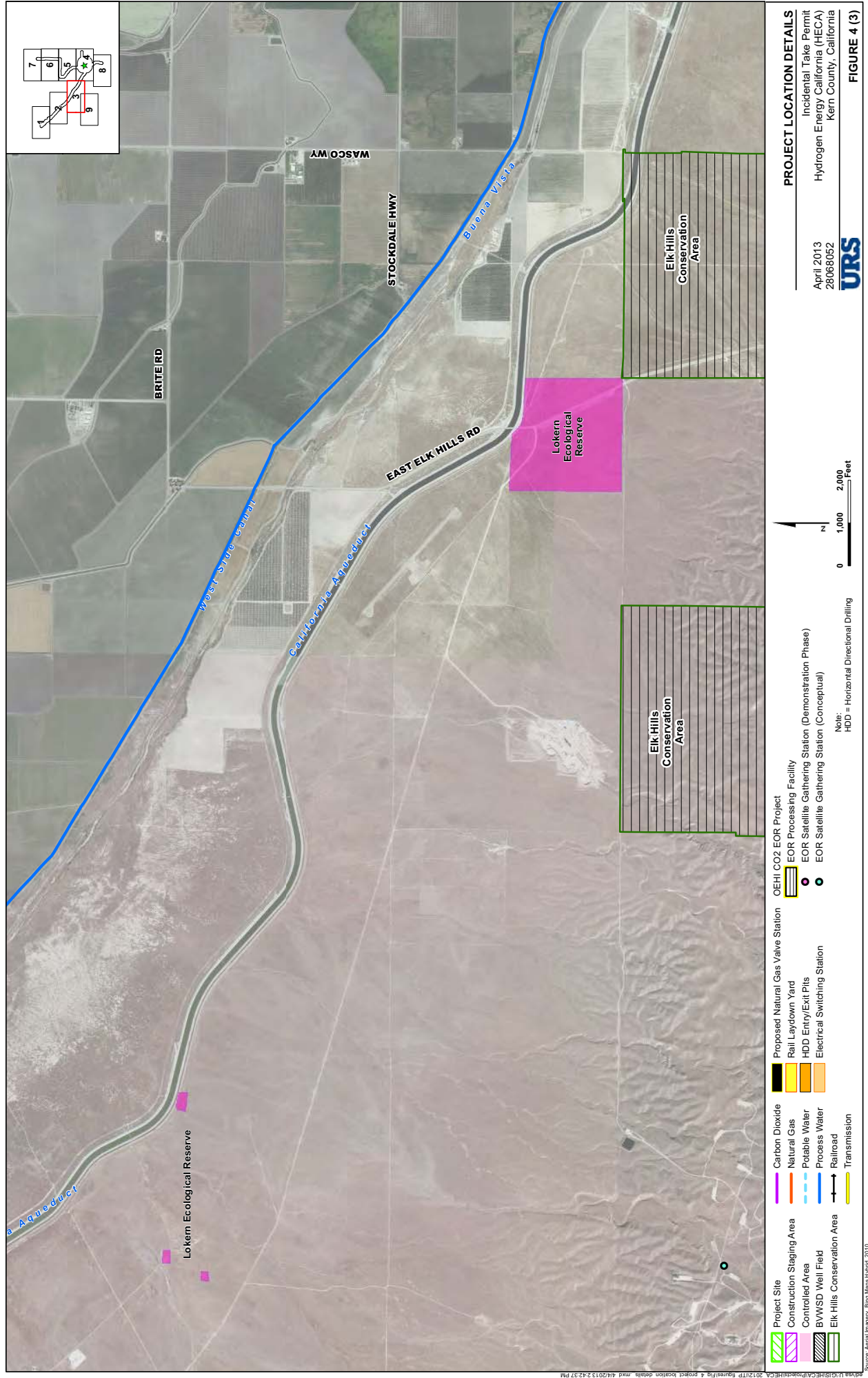
April 2013	Incidental Take Permit
28068052	Hydrogen Energy California (HECA)
	Kern County, California

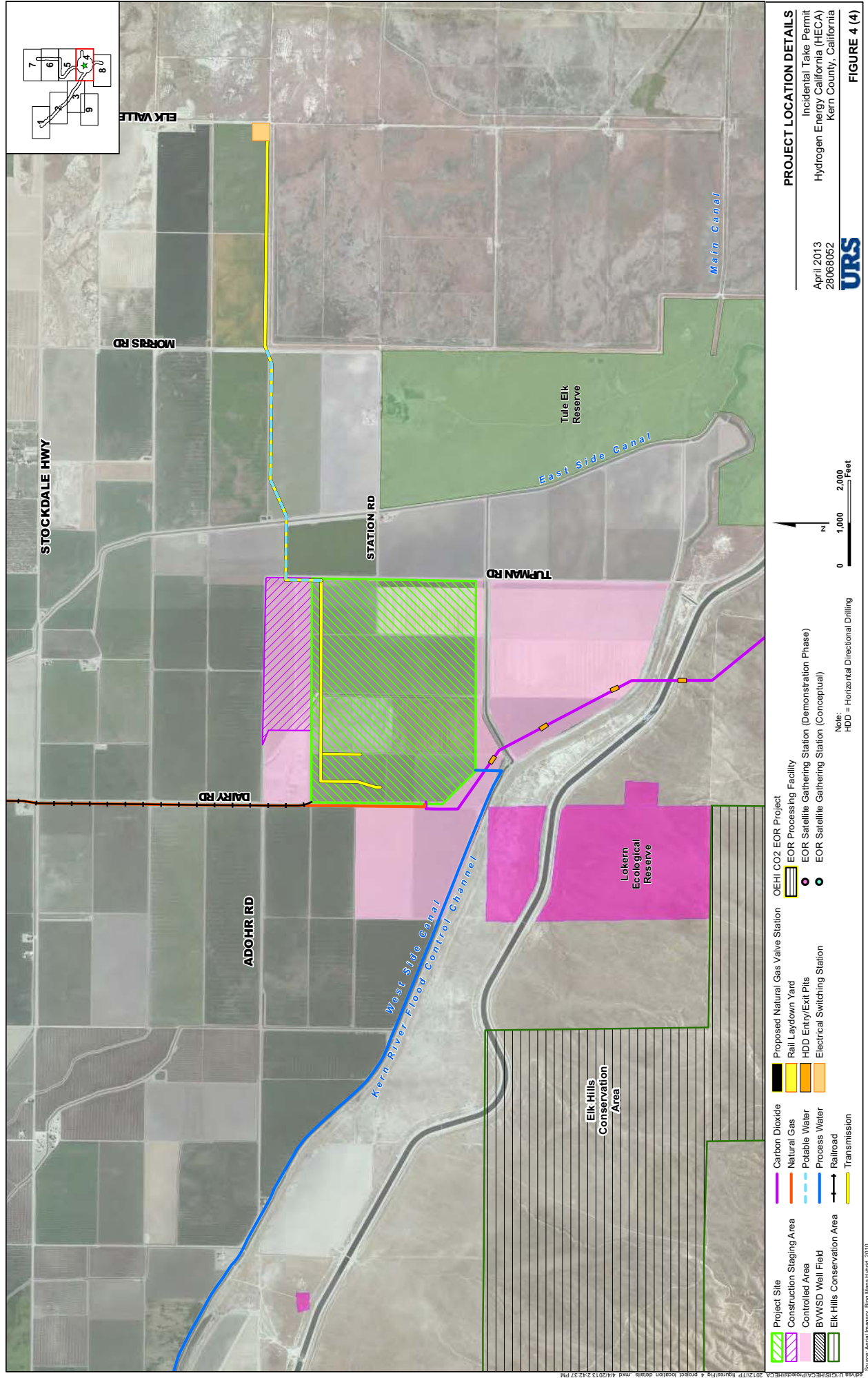
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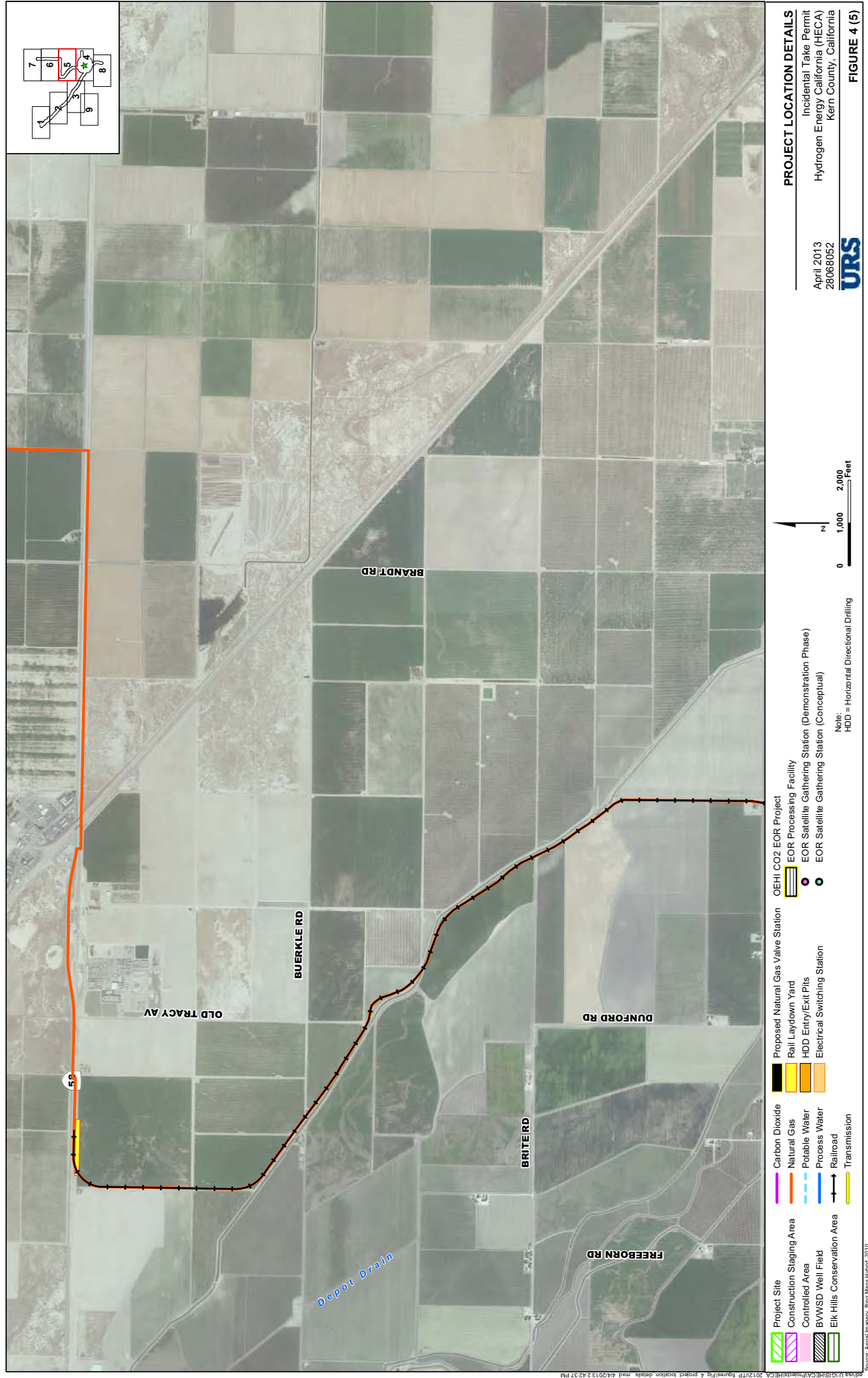
FIGURE 3

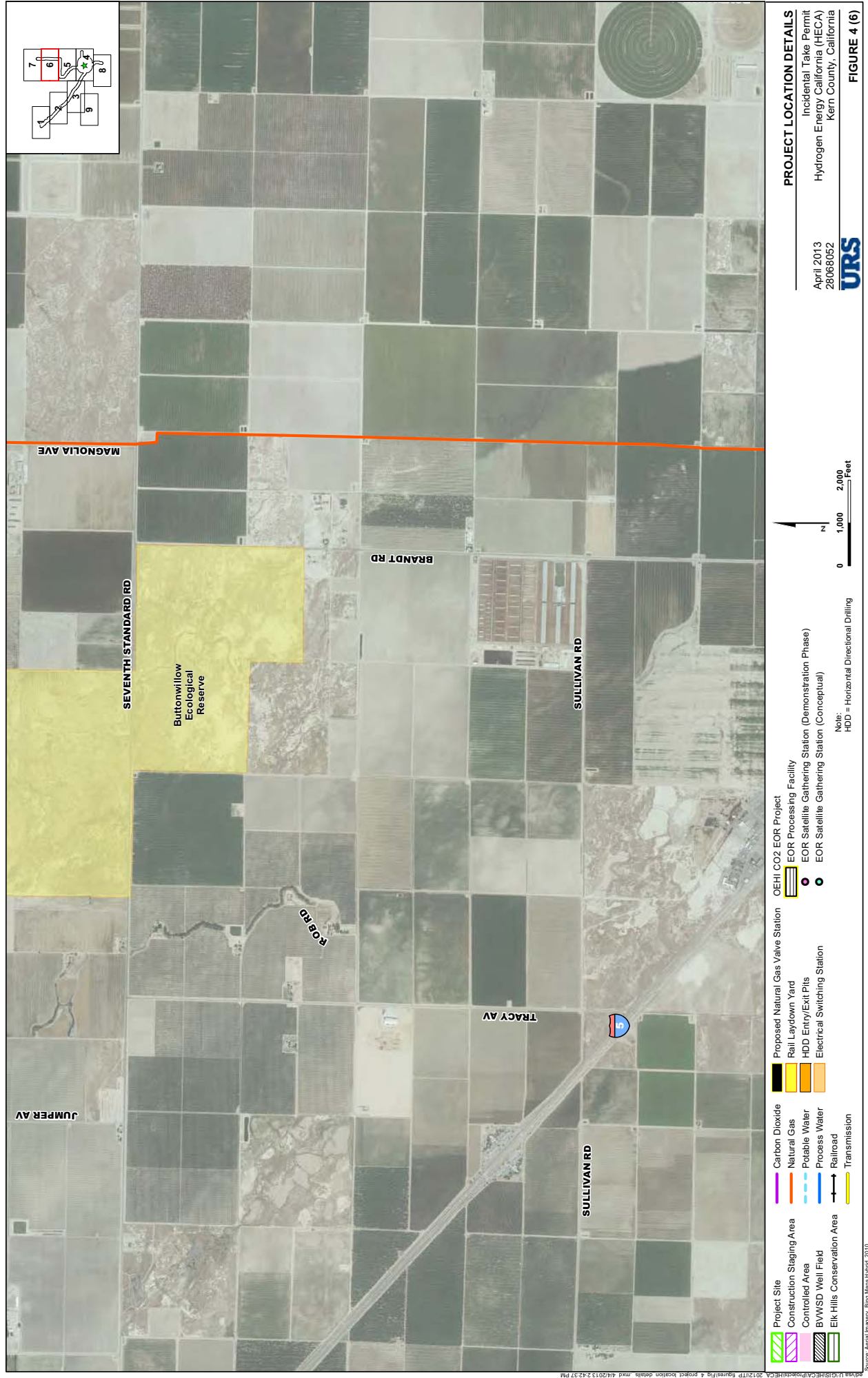


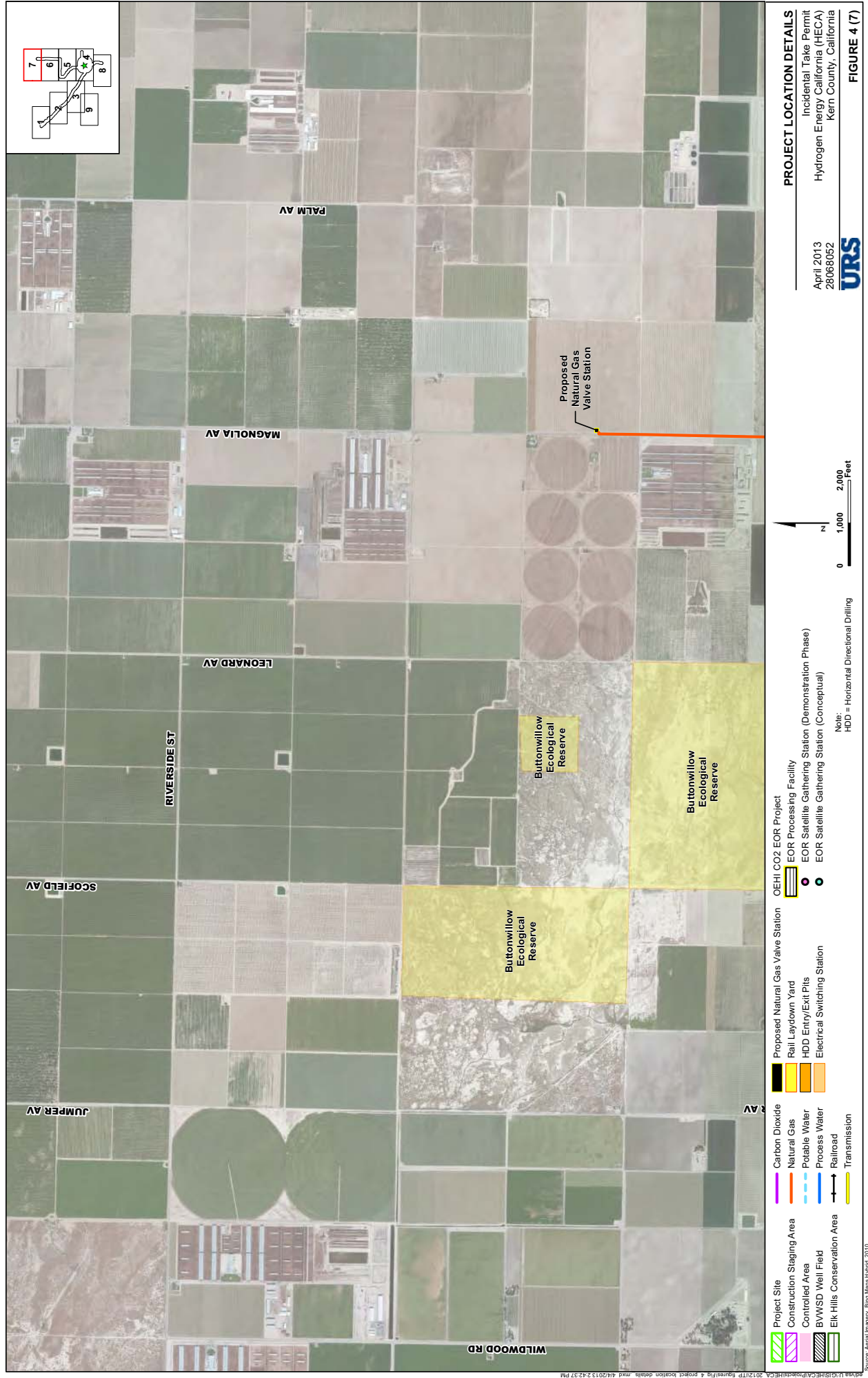


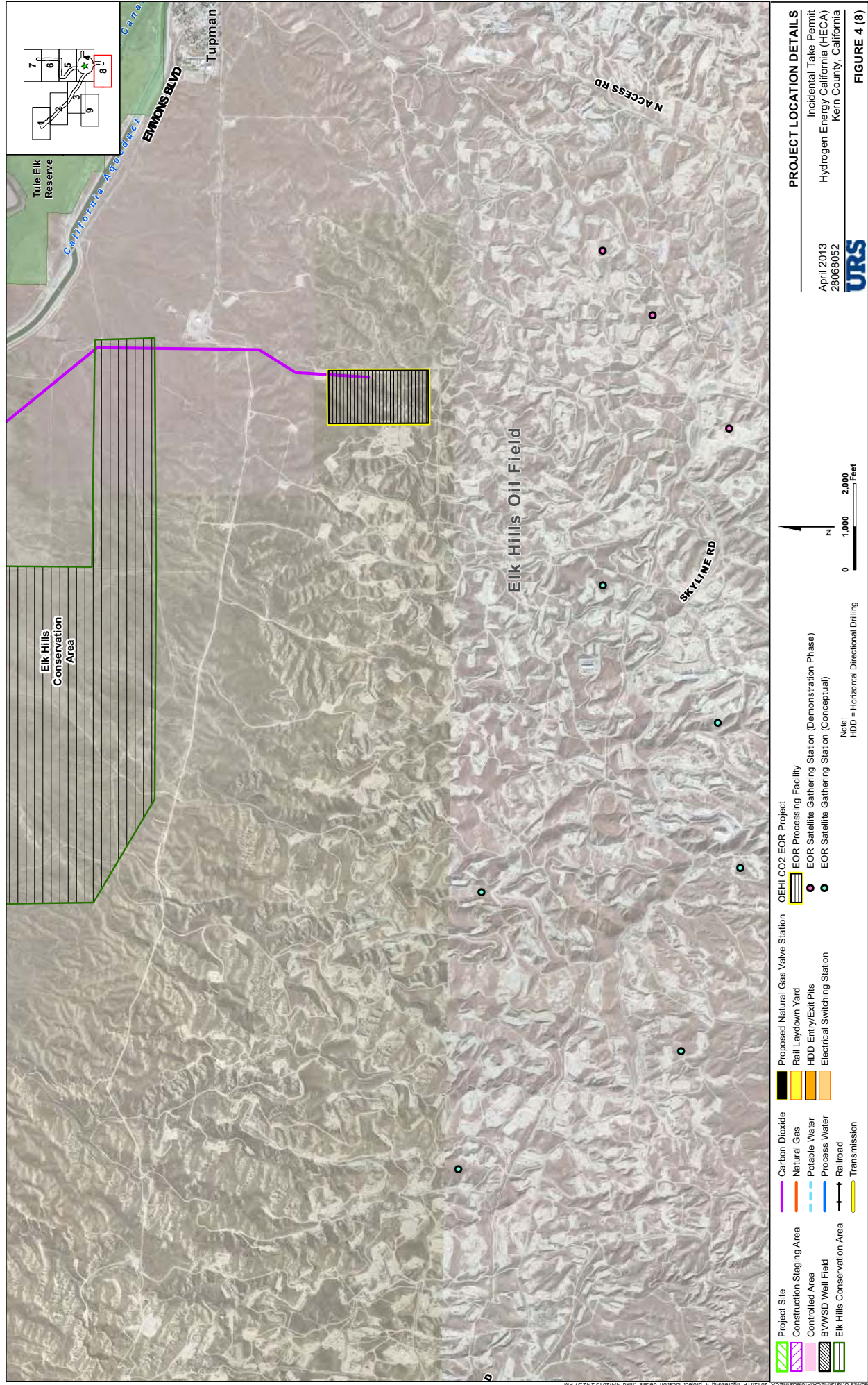


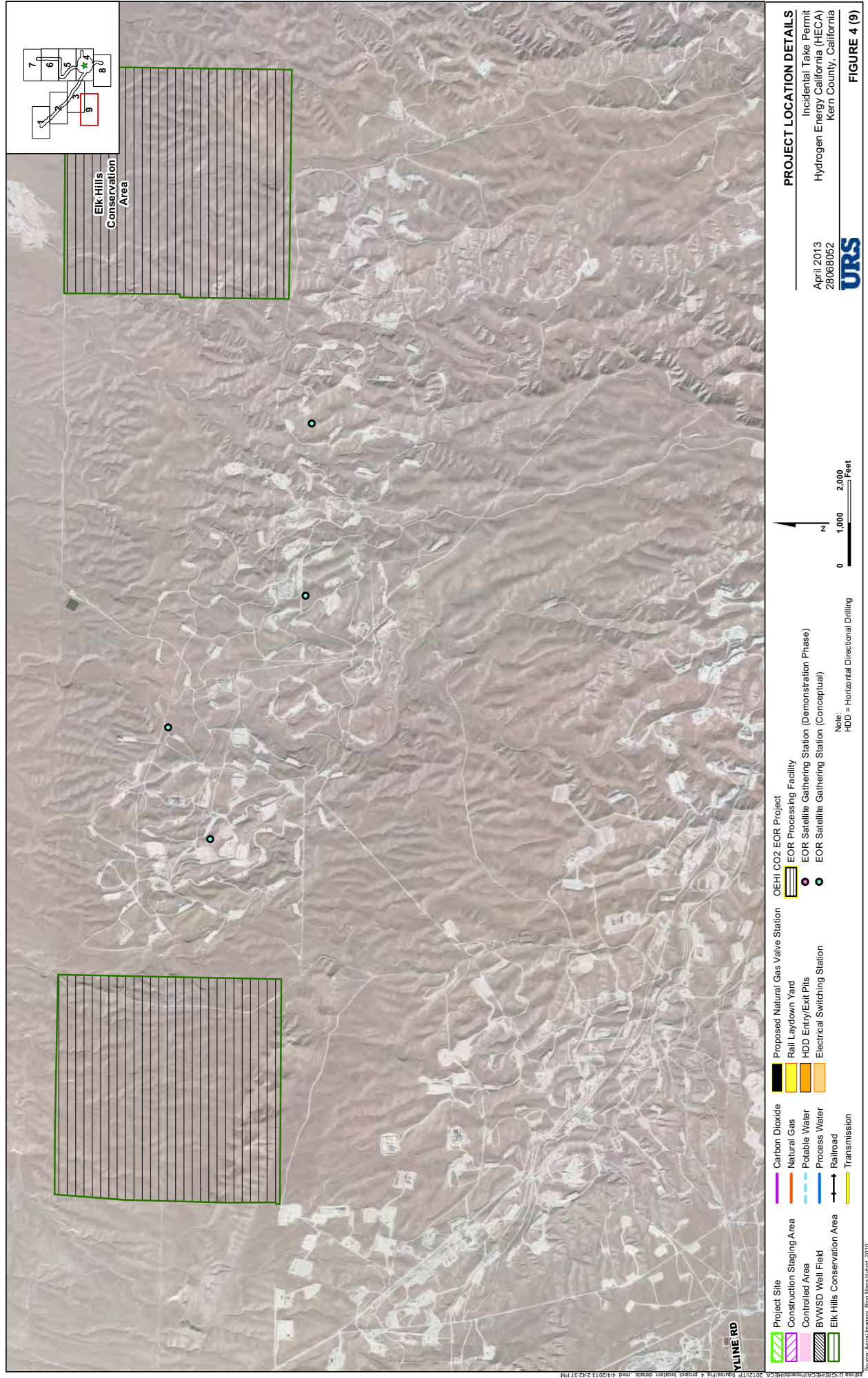


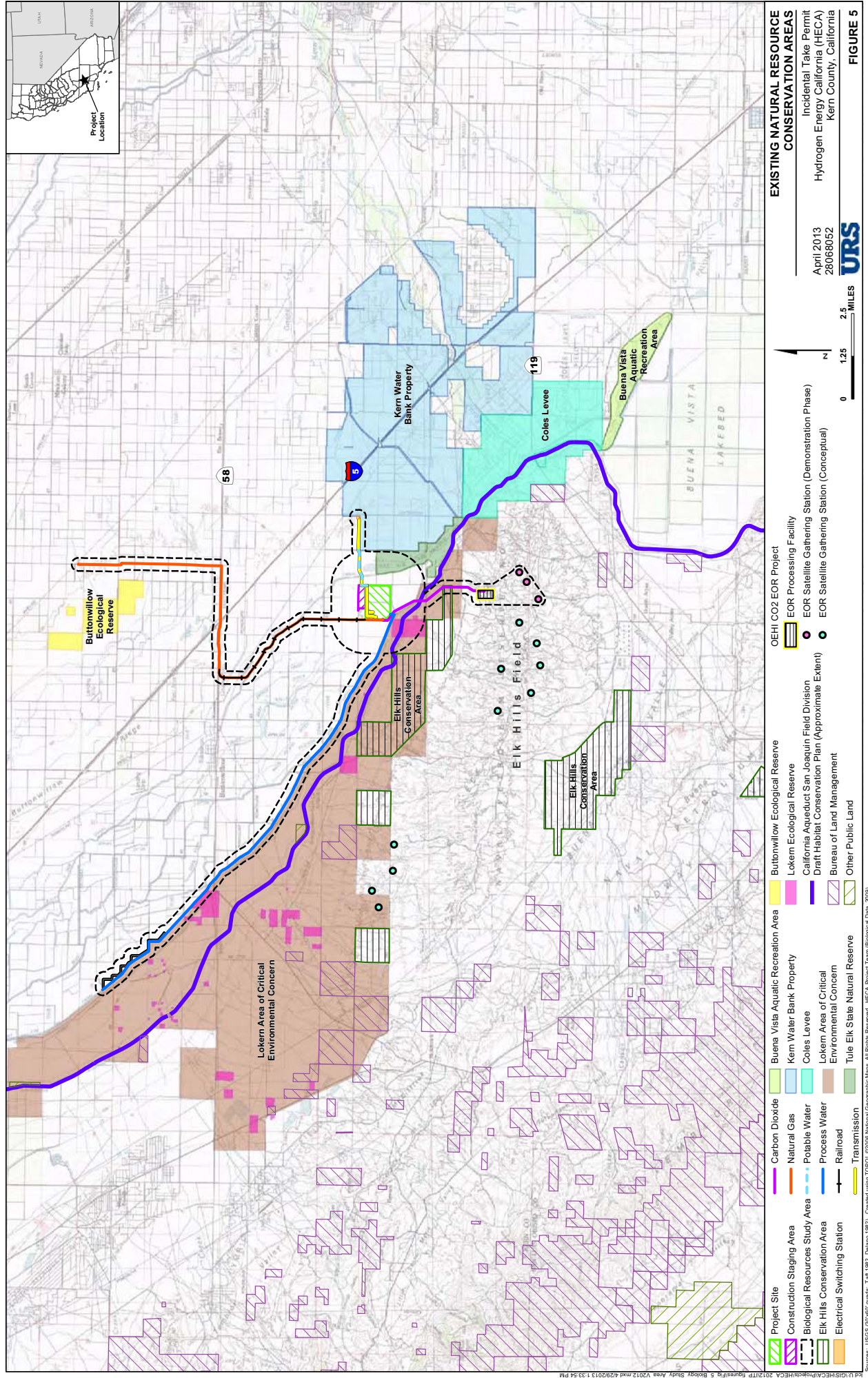




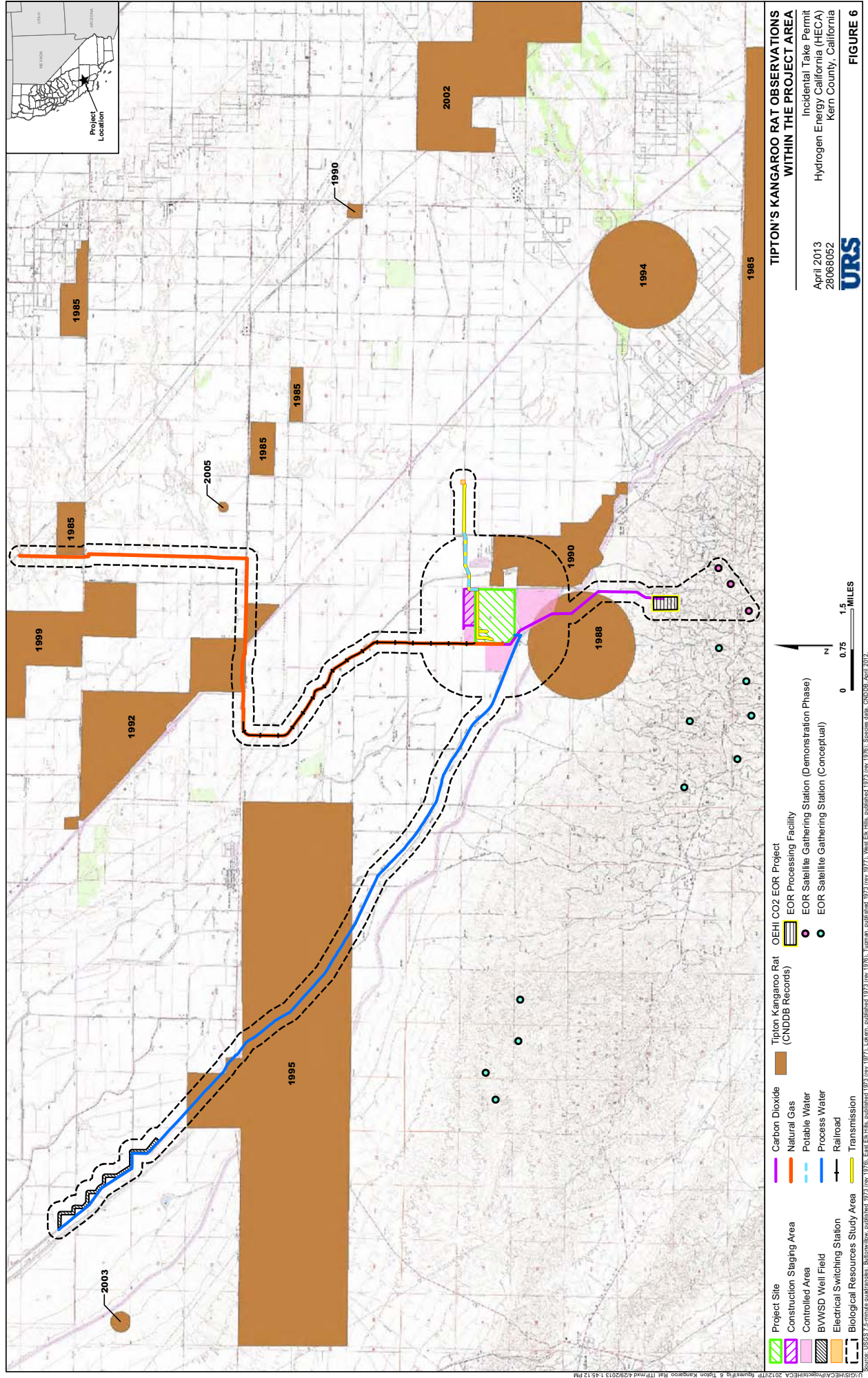


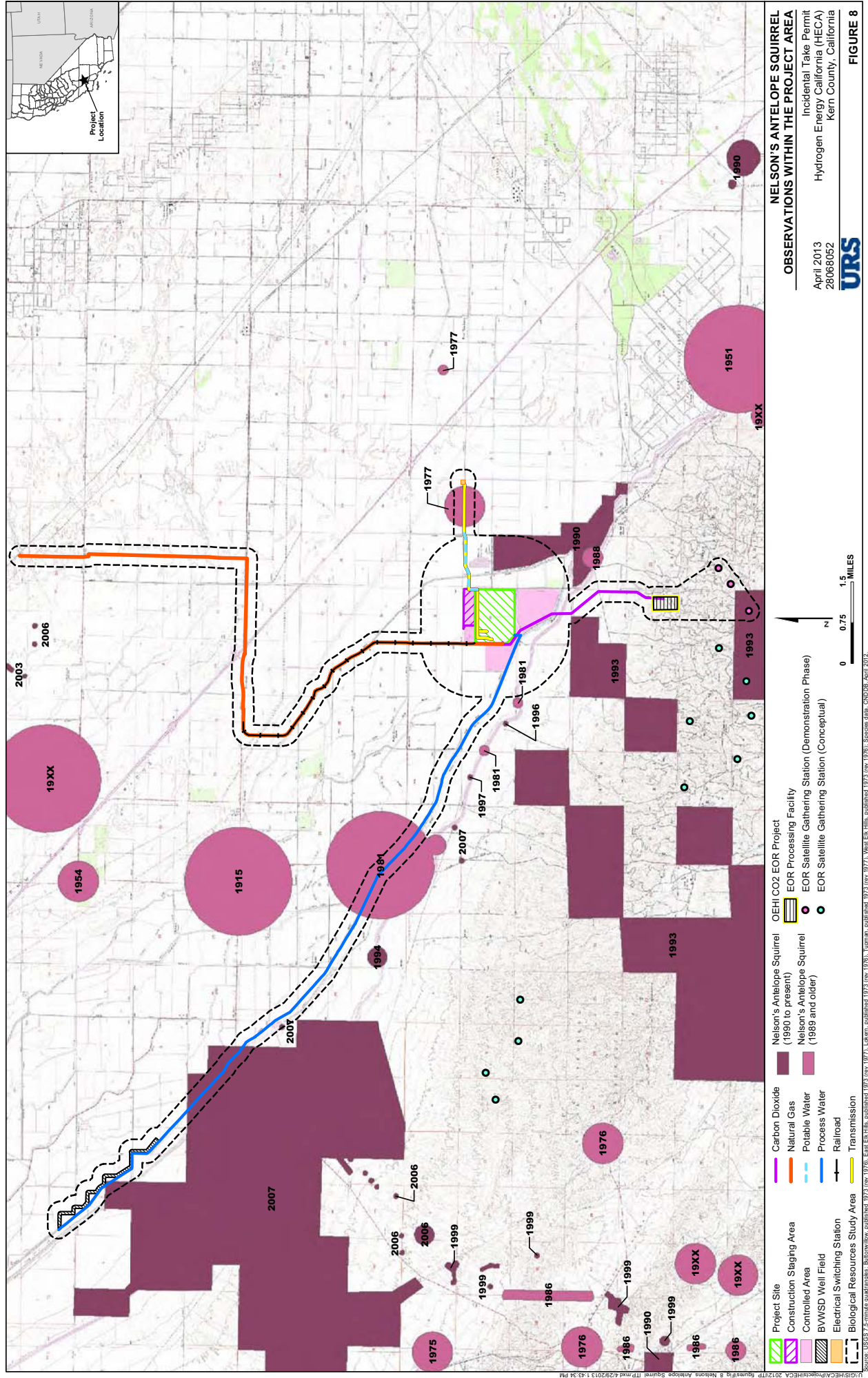


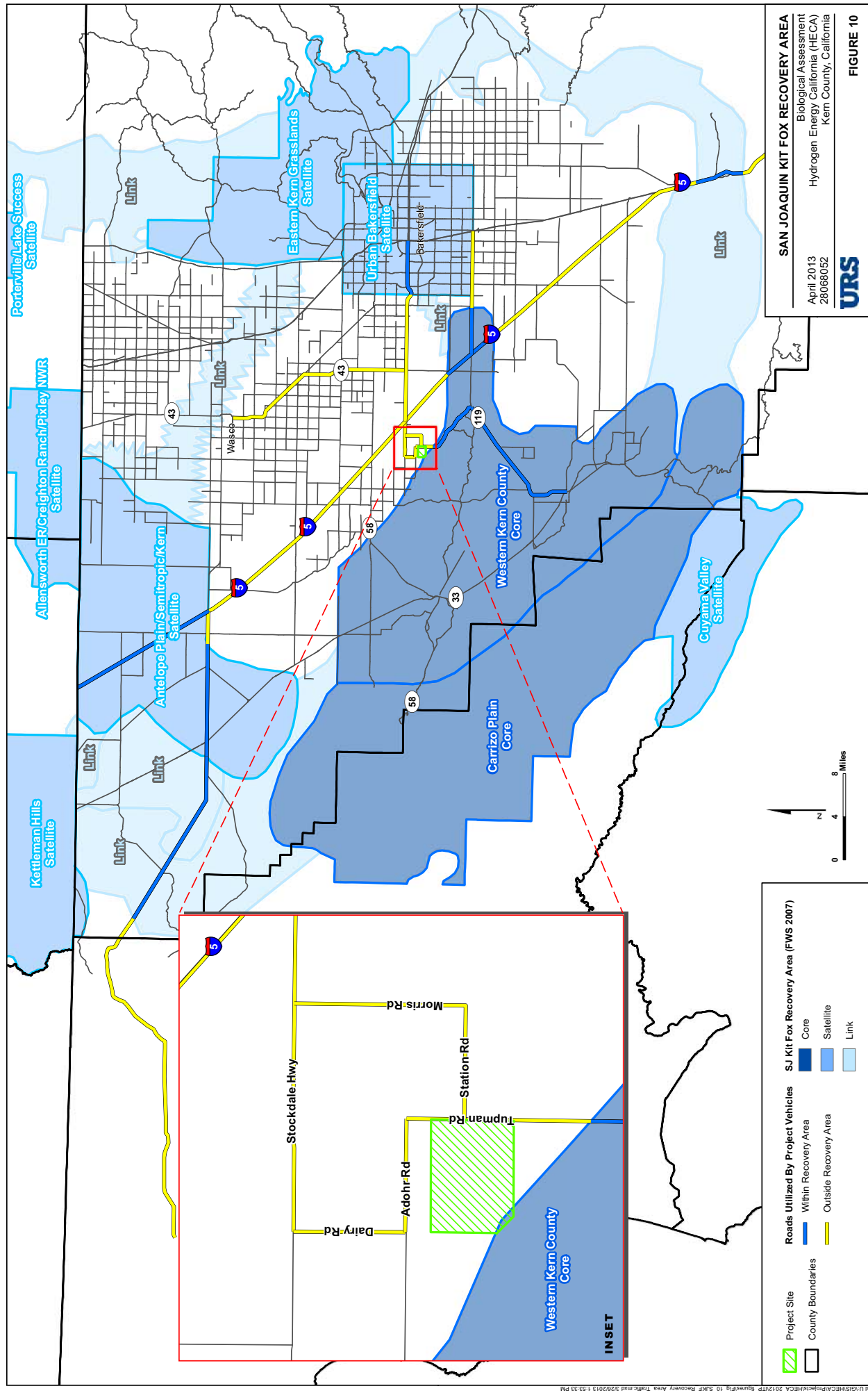


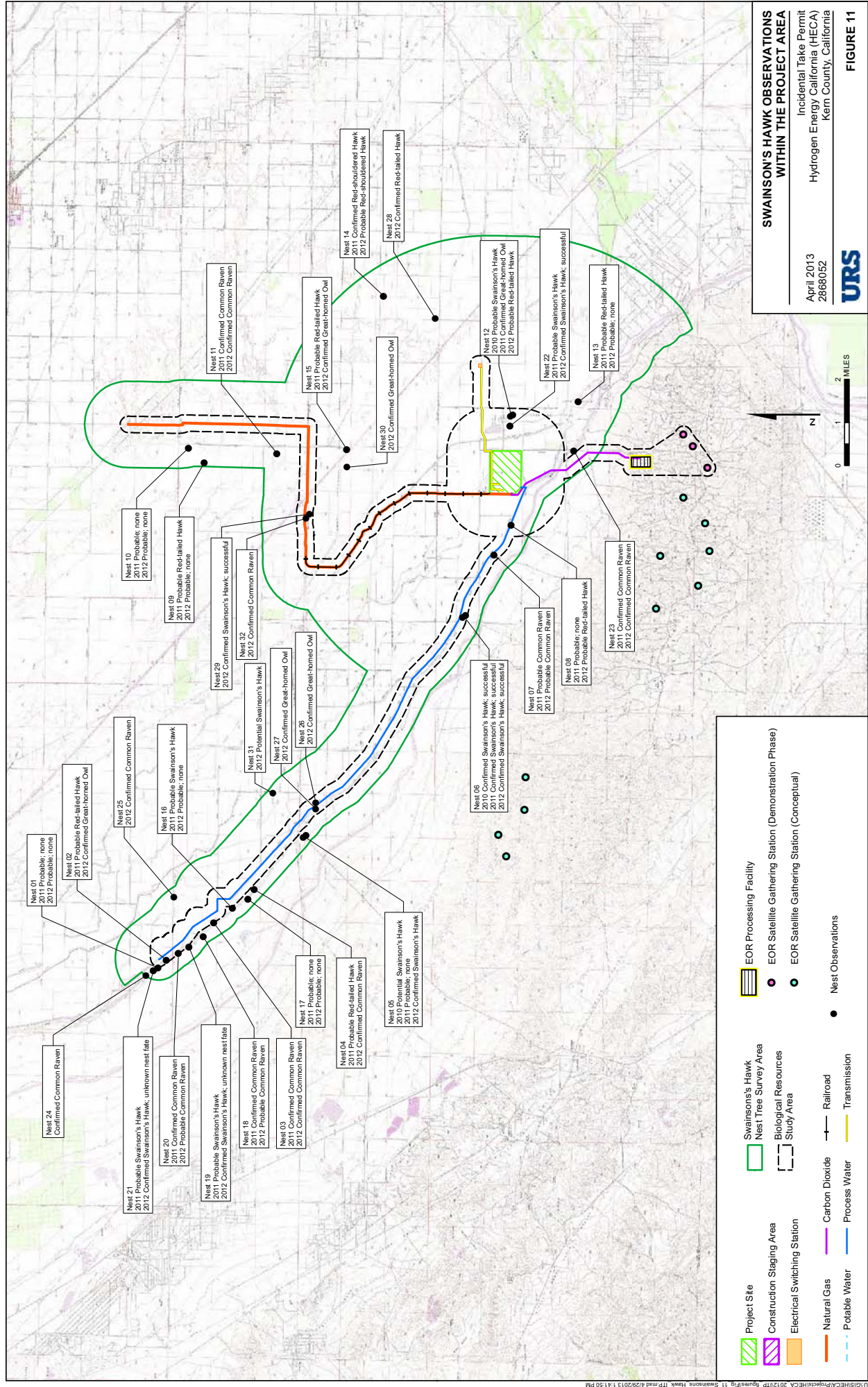


Sources: USGS (07'60" quads: T 14 1982, Delano 1982). Created using TOPOI, CO2008 National Geographic Maps, All Rights Reserved. HECA Project Team (Biological Data: 2009)









ATTACHMENT A54-3
APPLICATION FOR RWQCB 401 WATER QUALITY CERTIFICATION
AND WASTE DISCHARGE REQUIREMENTS



March 25, 2013

Bridget Supple
Section 401 Water Quality Certification Program
Regional Water Quality Control Board, Central Valley Region
1685 E Street
Fresno, CA 93706

Re: Application for 401 Water Quality Certification and Waste Discharge Requirements
Hydrogen Energy California Project

Dear Ms. Supple:

Hydrogen Energy California, LLC (HECA) proposes to construct an integrated gasification combined-cycle polygeneration project in western Kern County, California. The enclosed application for Water Quality Certification and Waste Discharge Requirements is submitted for your review on behalf of HECA. HECA is requesting a water quality certification from the Regional Board for the placement of temporary and permanent fill in waters of the State associated with the proposed project and the related Occidental of Elk Hills, Inc. (OEHI) Project, also described in the enclosed materials. A detailed description of the proposed project and the waters of the State that would be affected by the proposed project are provided in the enclosed documents. All of the permanently impacted waters are artificial drainage ditches and irrigation canals that have minimal ecological or hydrological functions or services.

A check in the amount of \$944.00 payable to the State Water Resources Control Board is enclosed with this submittal.

A separate Preconstruction Notification has been submitted to the U.S. Army Corps of Engineers consistent with the requirements for coverage under the Nationwide Permit program.

We look forward to working with you towards the successful completion of this process. Please contact Steve Leach, at (510) 874-3205 or Jan Novak at (510) 874-1733 regarding the enclosed documents.

Sincerely,

URS Corporation

A handwritten signature in blue ink, appearing to read "Dale Shileikis", is positioned above the printed name.

Dale Shileikis
Project Manager
URS Corporation

Enclosures (one paper copy and on CD):
HECA Application for 401 Water Quality Certification
HECA Jurisdictional Delineation Report

cc: Marisa Mascaro, HECA

URS Corporation
One Montgomery Street, Suite 900
San Francisco, CA 94104-4538
Tel: 415.896.5858
Fax: 415.882.9261

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD CENTRAL VALLEY REGION

SECTION 401 WATER QUALITY CERTIFICATION APPLICATION FORM

A minimum of \$944.00 processing fee is required; however, additional fees in accordance with Title 23 CCR § 2200 (a)(2) may also be required. Please use the fee calculator at http://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/dredgefillfeecalculator.xls to determine the total fee. Please include a check payable to the **State Water Resources Control Board**. Attach additional sheets as necessary. If any information is not applicable to the proposed project please indicate that as N/A. Submit the complete form to the appropriate Regional Board office.

1. APPLICANT INFORMATION

2. AGENT INFORMATION*

Applicant: Hydrogen Energy California (HECA)	Agent: URS Corporation
Contact Name: James Croyle	Contact Name: Dale Shileikis
Address: 30 Monument Square, Suite 235	Address: 1333 Broadway Suite 800
Concord, MA 01742	Oakland, CA 94612
Phone No: (978) 287-9529	Phone No: (415) 896-5858
Fax No: (978) 287-9512	Fax No: (415) 882-9261
E-mail Address: jcroyle@scsenergyllc.com	E-mail Address: Dale.shileikis@urs.com

*Complete only if applicable

3. PROJECT DESCRIPTION

a) Project Title: Hydrogen Energy California (HECA)
b) Project Location: <u>7361 Adohr Road, Buttonwillow, CA 93206</u> County: <u>Kern</u> Section: <u>10</u> Township: <u>30 South</u> Range: <u>24 East</u> Quadrangle Name: <u>East Elk Hills</u> Latitude: <u>35.33309</u> Longitude: <u>-119.387784</u> *Attach site map with "waters" clearly indicated (e.g., USGS 7 ½ quadrangle map)
c) Project Description (Please provide a detailed explanation of all project activities. Include applicable information such as: avoidance and minimization measures for project impacts; alternatives analysis; project activity impacts to water bodies and/or water quality; and implementation of Low Impact Development (LID) strategies. Attach additional pages as necessary): Please see Supplemental Information, Appendix A, Project Description.
d) Proposed Schedule (start date, and completion date): Please see attached supplemental information for the Proposed Schedule timeline.
e) Total Project Size (clearing, grading, other construction activities): <u>837</u> acres <u>176,880</u> linear feet (if appropriate)

4. IMPACTED WATER BODIES

a) Name(s) of Receiving Water Body(ies):

Figure 1 shows the water features to be impacted by project activities. These features include the Kern River Flood Control Channel (KRFCC), the West Side Canal, the East Side Canal, as well as numerous other unnamed canals/ditches. Some of these canals/ditches are actively used for agricultural purposes, the rest are abandoned or otherwise out of use. These features are also presented in the supplemental information attachment, Tables 2 and 3.

b) Anticipated potential stream flow during project activity:

The majority of construction activity in canals and ditches will occur during the dry season, when precipitation is generally absent from the region. The West Side Canal and East Side Canal are used for the active conveyance of agricultural water, so may contain water throughout the year. However, by working with the Buena Vista Water Storage District, it is likely that the canals can be kept dry for the pipeline work. The Kern River Flood Control Channel may contain flow during severe rain events, but is otherwise largely dry throughout the year and has only minimal pockets of riparian vegetation.

c) Describe potential impacts to water quality:

Please see attached supplemental information for specific details on potential impacts to water quality.

d) **Waters of the United States:** Indicate in ACRES and LINEAR FEET (where appropriate) the proposed waters of the United States to be impacted by any discharge other than dredging, and identify the impacts(s) as permanent and/or temporary for each water body type listed below:

Water Body Type	Permanent Impacts		Temporary Impacts	
	(acres)	(linear feet)	(acres)	(linear feet)
Jurisdictional Wetland	0	0	0	0
Riparian	0	0	0	0
Streambed un-vegetated	0	0	0.20	0
Lake/Reservoir	0	0	0	0

e) **Non-Federal Waters:** This section is **only** for waters that the U.S. Army Corps of Engineers does **not** consider federally jurisdictional. Indicate in ACRES and LINEAR FEET (where appropriate) the proposed **waters of the State** to be impacted by any discharge other than dredging, and identify the impacts(s) as permanent and/or temporary for each water body type listed below:

Water Body Type	Permanent Impacts		Temporary Impacts	
	(acres)	(linear feet)	(acres)	(linear feet)
Isolated Wetland	0	0	0	0
Ditch/Canal	8.11*	19,217	2.23	8,764
Other	0	0	0	0

* The drainage ditches and irrigation canals that would be permanently filled are shown in Figure 1 and Supplemental Information Table 3. These artificial features appear to have been excavated in uplands, and have minimal ecological or hydrological functions or services.

- f) **Fill:** Indicate the amount (cubic yards) and type of fill material to be discharged/installed in waters of the State/United States:

Type of Material Concrete or steel support piles.	Amount No more than 30 cubic yards.	What type of water body? Canal	Indicate if fill is in federal or non-federal waters Non-federal waters
Only the East Side Canal will be impacted by the addition of concrete or steel piles. See the attached supplemental information for information regarding fill.			

- g) **Dredge/Removal:** Indicate the amount (cubic yards) and type of material to be dredged and/or removed from waters of the State/United States:

Type of Material (Soil, concrete, steel, rock.....)	Amount (cubic yards)	What type of water body? (Wetland, riparian, streambed, lake.....)	Indicate if dredge or removal is in federal or non-federal waters
No dredging or removal of material from any waters would occur during project activities.			

5. COMPENSATORY MITIGATION

- a) Indicate in ACRES and LINEAR FEET (where appropriate) the total quantity of **waters of the United States** proposed to be Created, Restored and/or Enhanced for purposes of providing Compensatory Mitigation. If mitigating for state waters that were not considered federally jurisdictional then attach a description of the proposed mitigation:

Water Body Type	Created		Restored		Enhanced	
	(acres)	(linear ft)	(acres)	(linear ft)	(acres)	(linear ft)
Jurisdictional Wetland						
Riparian						
Streambed			0.20			
Lake/Reservoir						

- b) If contributing to a Mitigation or Conservation Bank, indicate the agency, dollar amount, acreage, and water body type (if applicable): N/A
 Mitigation Bank or Conservation Agency _____
 \$ _____ for _____ acres of _____ (water body type)
 How many acres of this mitigation area qualify as waters of the United States? _____
See Section 1.3 in the attached supplemental information for information regarding compensatory mitigation.

- c) Other Mitigation (omit if not applicable): N/A

How many acres of this mitigation area qualify as waters of the United States? _____

- d) Location of Compensatory Mitigation Site(s) (attach map of suitable quality and detail): N/A

City of Area _____ County _____

Longitude/Latitude _____ Township/Range _____

6. OTHER ACTIONS/BEST MANAGEMENT PRACTICES (BMPs)

Briefly describe other actions/BMPs to be implemented to Avoid and/or Minimize impacts to waters of the United States, including preservations of habitats, erosion control measures, project scheduling, flow diversions, etc.

Standard actions and best management practices will be implemented at each site prior to, during, and after construction to avoid (preferred) and/or minimize impacts to waters of the US and waters of the State. Please see the attached supplemental information for details regarding Best Management Practices.

7. OTHER PERMITS/AGREEMENTS/ETC

a) U.S. Army Corps of Engineers Permit: Indicate the type of ACOE permit (*check one*)

Nationwide Permit No(s): 33 Individual Permit No(s): _____ Regional Permit No(s): _____

Letter(s) of Permission _____ ACOE Permit Reference Number _____

Have you notified ACOE of project? Yes

Have you reviewed the General Conditions for your ACOE permit? Yes

Have you attached a copy of the application/notification to ACOE? No, Application Pending

b) California Department of Fish and Game Lake or Streambed Alteration Agreement:

Date of Application: Pending

Have you attached a copy of the application? No

Has the Agreement been issued? Pending if so, list Agreement number: _____

c) Water Rights: N/A

If the project is directly related to any diversion, obstruction, extraction, or impoundment of the natural flow of a river, stream, lake or underground source then provide the Water Right

Application ID Number: _____ or Permit ID Number: _____

8. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

a) Indicate the type of CEQA Document required for this project:

Final Staff Assessment (through California Energy Commission)

Has the document been certified/approved, or has a Notice of Exemption been filed? Pending

If yes date of approval/filing Pending If no, expected approval/filing date: _____

Lead Agency California Energy Commission

Have you attached a copy of the draft/final CEQA documentation*? See supplemental information

* A final copy of valid CEQA documentation must be provided before a project can be certified

As the lead agency under CEQA, The California Energy Commission (CEC) will develop and submit

a Final Staff Assessment (FSA) for the Project. The FSA will satisfy the CEQA conditions of certification for the Section 401 Permit. The CEC will provide a copy of the FSA to the CVRWQCB, amongst others. Therefore, no CEQA documentation will be submitted with this application package.

b) List State and Federal Threatened/Endangered Species that could potentially be impacted by this project:

Please see Table 4 in the attached supplemental information.

9. PAST/FUTURE PROPOSALS BY THE APPLICANT

Briefly list/describe any projects carried out in the last 5 years or planned for implementation in the next 5 years that are in any way related to the proposed activity or may impact the same receiving body of water. Include the estimated adverse impacts from the past or future projects.

No projects have been identified that either have or will impact the waters identified in this permit application in the time frame specified above.

SIGNATORY REQUIREMENTS

All reports, notices, or other documents required by the Water Quality Certification or requested by the Central Valley Regional Water Quality Control Board (Central Valley Water Board) shall be signed by a person described below or by a duly authorized representative of that person.

- a. For a corporation: by a responsible corporate officer such as (1) a president, secretary, treasurer, or vice president of the corporation in charge of a principal business function; (2) any other person who performs similar policy or decision-making functions for the corporation; or (3) the manager of one or more manufacturing, production, or operating facilities if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- b. For a partnership or sole proprietorship: by a general partner or the proprietor.
- c. For a municipality, State, federal, or other public agency: by either a principal executive officer or ranking elected official.

10. CERTIFICATION [Any person signing or submitting a document, e.g., an application, a monitoring report, etc., to demonstrate compliance with the Water Quality Certification regulations shall make the following certification, whether written or implied]

"I certify under penalty of law that this document, including all attachments and supplemental information, were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Print Name: James L. Croyle Title: CEO

Signature: James L. Croyle Date: 3/22/2013

STATEMENT OF AUTHORIZATION (if designating a specific agent)

I hereby authorize _____ to act on my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

X _____

DATE _____

APPLICANT'S SIGNATURE (not the authorized agent)

All information on this application becomes part of the public record, and as such is subject to public records requests disclosure. In addition, the application will be posted for public review on the Regional Board's web site in accordance with California Code of Regulations Title 23 Section 3858.

HYDROGEN ENERGY CALIFORNIA KERN COUNTY, CALIFORNIA

SECTION 401 WATER QUALITY CERTIFICATION SUPPLEMENTAL INFORMATION

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URS Project Number 28068052

March 2013

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Appendices

Appendix A	Project Description
Appendix B	Preliminary Jurisdictional Delineation (provided separately)

Supplemental Information

Acronyms and Abbreviations

AFC	Application for Certification
BMP	best management practice
BRMIMP	Biological Resources Mitigation Implementation and Monitoring Plan
BVWSD	Buena Vista Water Storage District
CEQA	California Environmental Quality Act
CO ₂	carbon dioxide
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
DOE	The U.S. Department of Energy
EOR	enhanced oil recovery
HDD	horizontal directional drilling
HDDP	Horizontal Directional Drilling Plan
HECA	Hydrogen Energy California
NEPA	National Environmental Policy Act
OEHI	Occidental of Elk Hills, Inc.
PG&E	Pacific Gas and Electric
Project Site	The physical location or site where the power generating facility and associated structures or components would be built.
Project	Hydrogen Energy California LLC Integrated Gasification Combined-Cycle polygeneration project
ROW	right-of-way
syngas	synthesis gas
USFWS	United States Fish and Wildlife Service
WS	Waters of the State
WUS	Water of the United States

1.0 SUPPLEMENTAL INFORMATION

The following section contains supplemental information for the Hydrogen Energy California (HECA) Project Section 401 Permit Application. Information is organized by block and corresponding subject from the application form. Because of the size and complexity of the HECA Project, a complete and detailed project description is provided as an appendix (Appendix A).

The following terms are used throughout the application, and are defined below.

- HECA Project (or “Project”) –The Hydrogen Energy California Project as a whole.
- Main Project Site (or “Project Site”) – The physical location or site where the power generating facility and associated structures or components would be built.
- Controlled Areas – The area owned by HECA that is located immediately adjacent to the Main Project Site. The purpose of the Controlled Area is to ensure ownership and control by HECA LLC over public access and land use adjacent to the Project Site. With the exception of temporary construction impacts for linears and laydown, current plans are to continue to use the Controlled Area for agricultural purposes during construction and operations.
- Project Linears – Any or all of the linear utility components (such as rail lines or pipelines) that would be built offsite (i.e., not on the Main Project Site) as part of the Project.

1.1 BLOCK 3 – PROJECT DESCRIPTION

HECA LLC is proposing the HECA Project, an Integrated Gasification Combined-Cycle polygeneration project. HECA LLC is owned by SCS Energy California LLC. The HECA Project will gasify a 75 percent coal and 25 percent petroleum coke fuel blend to produce synthesis gas (syngas). Syngas produced via gasification will be purified to hydrogen-rich fuel, which will be used to generate low-carbon baseload electricity in a Combined-Cycle Power Block; low-carbon nitrogen-based fertilizer in an integrated Manufacturing Complex; and carbon dioxide (CO₂) for use in enhanced oil recovery (EOR).

The fertilizer and power produced by the HECA Project have a low-carbon footprint, because more than 90 percent of the CO₂ in the syngas is captured, and approximately 3 million tons per year of CO₂ is transported via pipeline for use in EOR, which results in simultaneous sequestration (storage) of the CO₂ in a secure geologic formation. CO₂ will be transported for use in EOR in the adjacent Elk Hills Oil Field, which is owned and operated by Occidental of Elk Hills, Inc.

The U.S. Department of Energy (DOE) is providing financial assistance to the HECA Project under the Clean Coal Power Initiative Round 3 via a cost-sharing agreement with HECA LLC, covering project construction and a “Demonstration Period” for the first 2 years of project operations.

Supplemental Information

1.1.1 Proposed Schedule

Project construction activities are anticipated to start as early as late 2013, with completion of project activities to occur in 2017 or later.

1.1.2 Total Project Size

The Project Site consists of approximately 453 acres near a hydrocarbon-producing area in Kern County, California, as shown on Figure 1, Project Vicinity. (The total area, when including all linear features and CO₂ EOR Processing Facility, is 837 acres and 176,880 linear feet.) The Project Site is in a predominantly agricultural area of the county, approximately 2 miles northwest of the unincorporated community of Tupman.

The disturbance areas and lengths of all Project Components are presented in Table 1. Note that the areas and features presented in Table 1 describe the entirety of the HECA Project.

1.2 BLOCK 4 – IMPACTED WATER BODIES

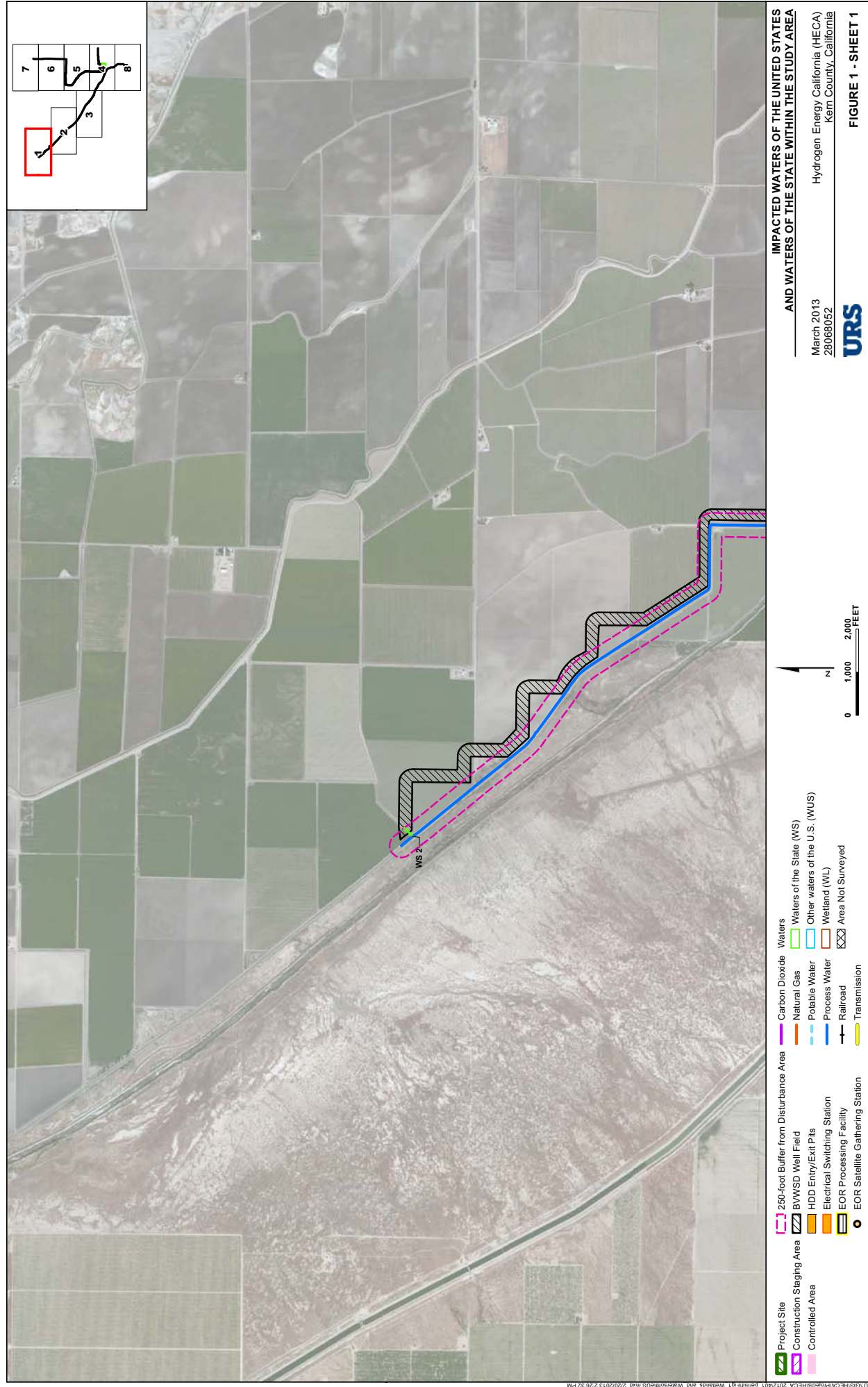
1.2.1 Describe Potential Impacts to Waterbodies

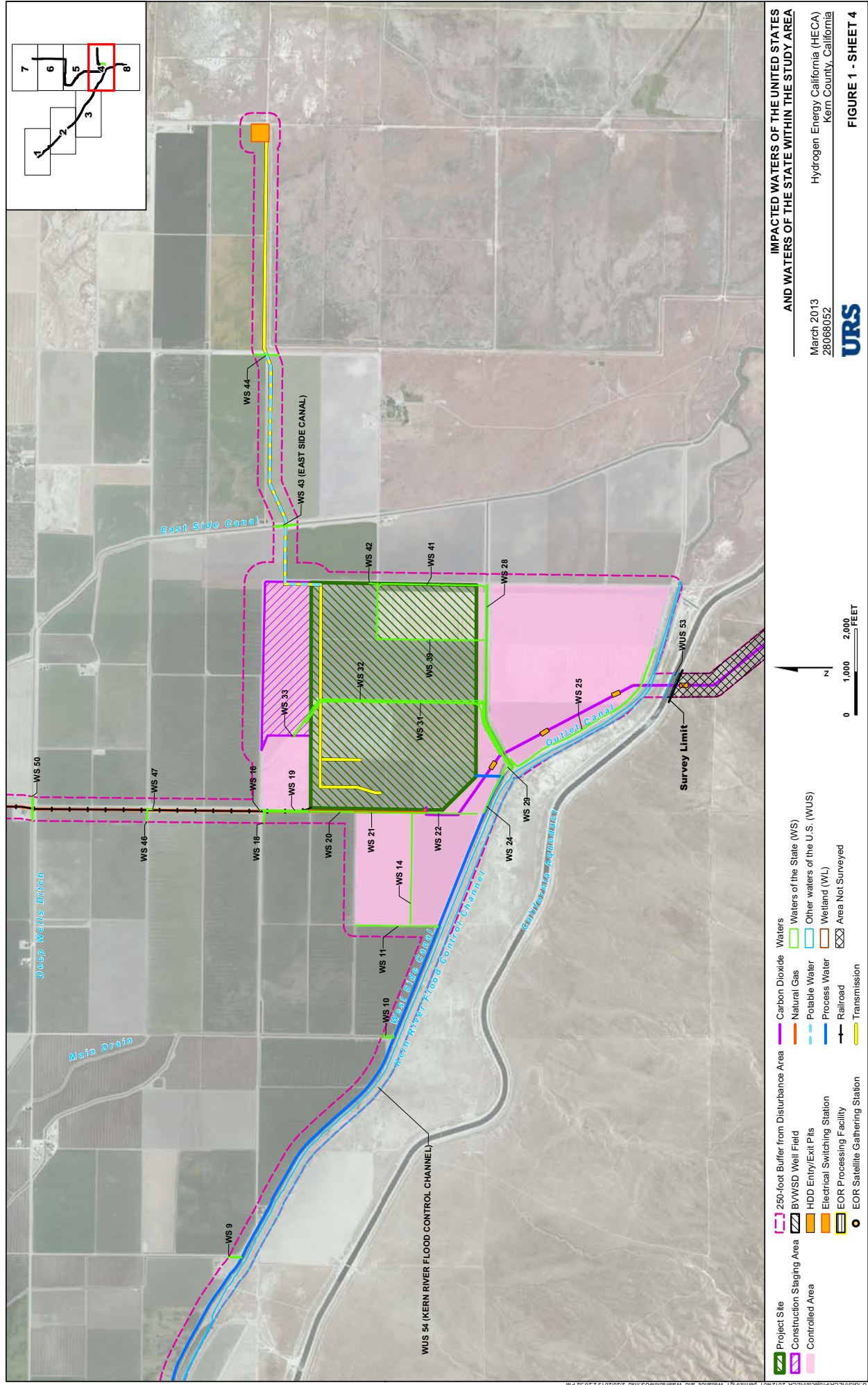
Project construction would result in permanent and temporary impacts to both Waters of the United States (WUS) and non-Federal Waters of the State (WS). Work will occur during dry conditions, when it is feasible to reduce potential impacts to water quality from erosion, sedimentation, and runoff.

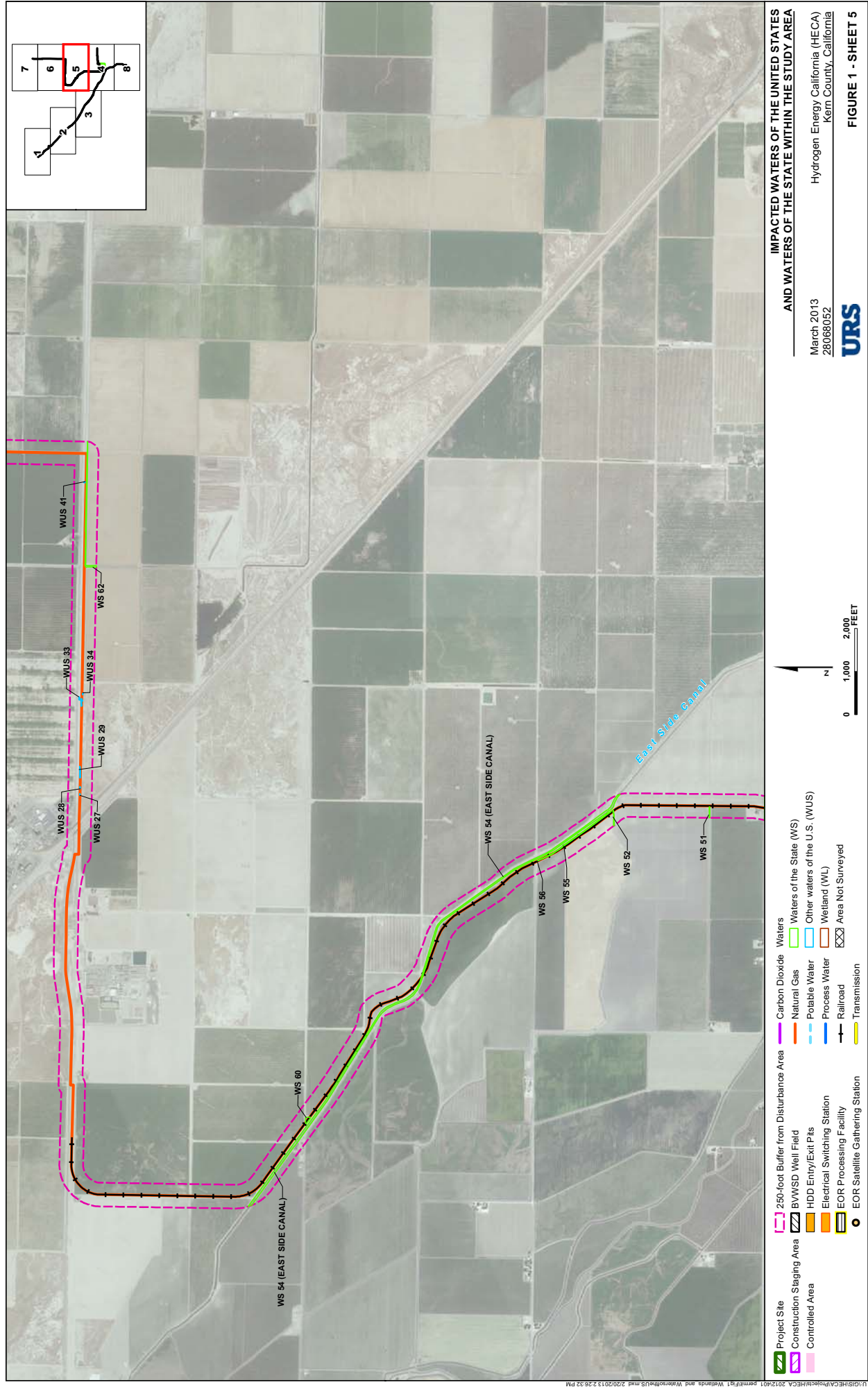
Water features in the footprint of the Project Linears would be temporarily excavated during the installation of pipeline and other linear features. Additionally, water features in the work area could be disturbed by construction equipment, work vehicle traffic, and the temporary placement of project materials. The implementation of the best management practices (BMPs) identified in Section 1.4 would eliminate these impacts. These features would be restored following the completion of construction activities.

The construction of the main power-generating facility would result in permanent and temporary impacts to WS. In areas in the main project footprint, some features would be permanently filled to make way for project foundation. Other features would only be temporarily impacted by construction activities.

The water features temporarily impacted during construction would be restored following completion of construction activities. Consistent with standard pipeline construction techniques, the upper 6 inches of soil (topsoil) excavated within nonwetland waters will be segregated, and stockpiled separately from the subsoil material. The pipeline trench will be backfilled in the order in which it was removed, and topsoil will be deposited last. Trenches will be slightly overfilled to account for future soil settlement. Backfilled soil will be compacted to a bulk density consistent with the adjacent soil.







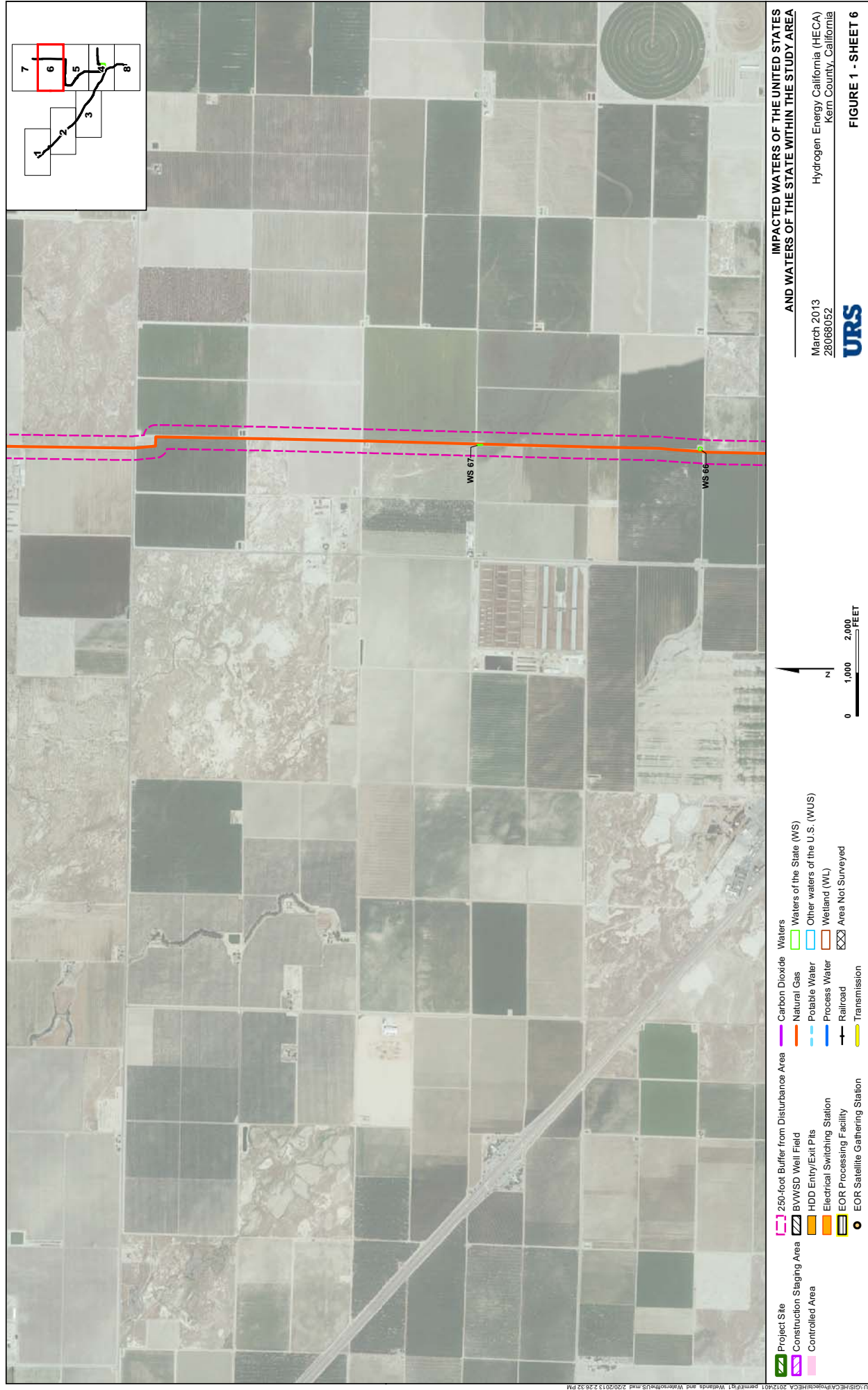


Table 1
Project Features¹

Project Component	Description	Approx. Linear Length (miles)	ROW Construction	ROW Permanent	Temporary Disturbance² (acres)	Permanent Disturbance³ (acres)
Project Site	453-acre HECA Project Site	N/A	N/A	N/A	453	453
Temporary Construction Area	Temporary disturbance: 91 acres in the Controlled Area. Permanent disturbance: None.	N/A	N/A	N/A	91	None
Railroad spur	Single track railroad. Temporary disturbance: 75 feet wide along linear length, plus 3 acres of laydown area. Permanent disturbance: 60 feet wide along linear length.	5.3	75 feet	60 feet	51.0	38.4
Natural gas linear	Temporary disturbance: 50 feet wide along linear length, plus 100-foot by 100-foot metering station at the inlet. Disturbance area shared with railroad spur. Permanent disturbance: Only the metering station at the inlet.	13	50 feet	25 feet	47.43 ⁴	0.23
BVWSD well field and process water pipeline	Temporary disturbance: 50 feet wide along linear length, plus 150-foot by 100-foot area of disturbance around each of 5 wells. Permanent disturbance: Only the areas around each well (100 feet by 100 feet).	15	50 feet	25 feet	90.25	1.15
Electrical transmission line	Temporary disturbance: 25-foot-wide road throughout linear length, plus up to 25-foot-diameter structural base for each of 15 poles. Permanent disturbance: Only the up to 25-foot-diameter structural base for each of 15 poles.	2.1	100 feet	100 feet	7.35	0.15
PG&E Switching Station	Proposed switching station site (417 feet by 417 feet).	N/A	N/A	N/A	4	4
Potable water pipeline	Temporary disturbance: 10 feet wide along linear length and within transmission line corridor. Permanent disturbance: None.	1	10 feet	N/A	Included with transmission line ⁵	N/A

Supplemental Information

Table 1
Project Features (Continued)¹

Project Component	Description	Approx. Linear Length (miles)	ROW Construction	ROW Permanent	Temporary Disturbance ² (acres)	Permanent Disturbance ³ (acres)
OEHI CO ₂ pipeline ⁶	Temporary disturbance: 80 feet along 15,240.8 feet of trenched pipe, plus 2 entry pits (120-foot by 100-foot each) and 2 exit pits for HDD (75-foot by 100-foot each), plus two 50-foot by 50-foot valve box areas. Permanent disturbance: Only the two 50-foot by 50-foot valve box areas.	3.4	50 to 80 feet	25 feet	29.00	0.11
OEHI EOR ⁷	EOR Processing Facility of 1,200 feet by 2,200 feet, plus 3 satellites (230 by 200 feet).	N/A	N/A	N/A	63.79	63.79
Total Disturbance					836.8	560.8

Notes:

- ¹ The areas and features presented in Table 1 describe the entirety of the HECA Project, and not disturbance impacts to jurisdictional water features.
 - ² Temporary disturbance area is the total area disturbed during construction, including areas that remain developed (permanently disturbed) after construction.
 - ³ Permanent disturbance area is the disturbed/developed area that remains after construction.
 - ⁴ The temporary disturbance area along the portion of the natural gas line that follows the railroad spur from the Project Site to the interconnection of the railroad with the existing San Joaquin Valley Railroad line is included in the temporary disturbance area for the railroad spur.
 - ⁵ The potable water pipeline temporary disturbance area is included in the temporary disturbance area for the electrical transmission line.
 - ⁶ Sources: 2012 Amended AFC, Appendix A-2 [Stantec (Stantec Corporation). Modified CO₂ Supply Line Alignment Data Gap Analysis. Prepared for Occidental of Elk Hills, Inc. April 2012.] and Response to California Energy Commission Data Request A59.
 - ⁷ See Appendix A.
- BVWSD = Buena Vista Water Storage District
CO₂ = carbon dioxide
EOR = enhanced oil recovery
N/A = not applicable
PG&E = Pacific Gas and Electric Company
OEHI = Occidental Elk Hills, Incorporated
ROW = right-of-way

1.2.2 Waters of the United States

Consultants for HECA have estimated a total of 0.20 acre of jurisdictional nonwetland WUS would be temporarily impacted during Project activities, based on the Project's Preliminary Jurisdictional Delineation, which is pending verification from the United States Army Corps of Engineers. These features are considered jurisdictional nonwetland WUS. An additional 0.24 acre (110 linear feet) of WUS are within the construction right-of-way, but will be avoided through horizontal directional drilling (HDD); they are described in more detail below. No WUS wetlands would be impacted, and no WUS would be permanently impacted. Table 2 presents the area of impact to WUS.

Table 2
Jurisdictional Waters of the United States to be Impacted

Project Component	Feature	Temporary Impact		Permanent Impact	
		acres	linear feet	acres	linear feet
Natural Gas Pipeline	WUS 27 (ponded depression)	0.01	—	—	—
	WUS 28 (ponded depression)	0.01	—	—	—
	WUS 29 (ponded depression)	0.10	—	—	—
	WUS 33 (ponded depression)	0.07	—	—	—
	WUS 34 (ponded depression)	0.01	—	—	—
	WUS 41 (ponded depression)	<0.01	—	—	—
Carbon Dioxide Pipeline	WUS 53 (California Aqueduct)	— ¹	— ¹	—	—
	WUS 54 (Kern River Flood Control Channel)	— ¹	— ¹	—	—
Totals²		0.20	0	—	—

Notes:

¹ Crossings of these features would be constructed using horizontal directional drilling; temporary impacts would only occur in the case of a frac-out.

² Totals include remainders from rounding.

The 0.20 acre of jurisdictional nonwetland WUS that would be temporarily impacted include features WUS 27, 28, 29, 33, 34, and 41, which would be impacted during the installation of the Project's natural gas pipeline. These WUS features would be temporarily excavated to install the pipeline, and then would be backfilled on completion of installation. The installation would require excavation depths of up to 7 feet below grade.

The Project's CO₂ pipeline would be installed beneath features WUS 53 and 54 (the California Aqueduct and the Kern River Flood Control Channel, respectively). To completely avoid impacts to these WUS, the pipeline would be installed, using HDD, at a depth of 50 to 100 feet below grade. A Horizontal Directional Drilling Plan (HDDP) will be prepared before any HDD activities occur. The HDDP will include a frac-out (unexpected leaking of hydraulic drilling fluid) spill response plan. In the case of a frac-out, any spilled hydraulic fluid would be cleaned up and removed from the water features, resulting only in temporary disturbance.

Supplemental Information

Waters of the State

State jurisdictional water features (WS) would be impacted during construction of the Project. These WS consist of engineered agricultural irrigation canals and ditches that lack a significant nexus to any WUS. Table 3 presents the area of impact to WS.

Grading and construction of the HECA Project Site would permanently fill or relocate several artificially constructed drainage ditches and irrigation canals, accounting for most of the permanent impacts to WS. These features appear to have been excavated in uplands, and do not meet the criteria of WUS. The affected drainage and irrigation features have minimal ecological or hydrological functions or services because they are artificially maintained and isolated from the regional water conveyance systems.

The construction of the railroad spur would require a bridge crossing over the East Side Canal, resulting in permanent impacts to WS from the installation of concrete or steel support piles. Although the installation of the railroad bridge would result in permanent impacts to WS, these WS impacts would not interfere with the ability of the East Side Canal to serve its purpose as an engineered agricultural irrigation canal, and the limited biological functions or values supported by the canal would not be reduced. The exact design of the crossing is not yet known, but support piles would likely span the entire width of the railroad spur, and have a length of approximately 24 inches. For permitting purposes, the maximum area of impact has been presented.

The Project's CO₂ pipeline would be installed beneath features WS 25 and 28 (the Outlet Canal and the West Side Canal, respectively). To completely avoid impacts to these WS, the pipeline would be installed, using HDD, at a depth of 50 to 100 feet below grade. A Horizontal Directional Drilling Plan (HDDP) will be prepared before any HDD activities occur. The HDDP will include a frac-out (unexpected leaking of hydraulic drilling fluid) spill response plan. In the case of a frac-out, any spilled hydraulic fluid would be cleaned up and removed from the water features, resulting only in temporary disturbance.

1.3 BLOCK 5 – COMPENSATORY MITIGATION

The WS to be permanently impacted consist of engineered irrigation canals and ditches used for agricultural purposes. These artificial, unvegetated canals and ditches have limited biological functions or values. After the construction of the HECA Project, all features necessary to continue agricultural production would be relocated (engineered to continue serving their singular purpose of irrigation). For this reason, no compensatory mitigation is proposed for the permanent impacts to these WS.

No compensatory mitigation or other compensation is proposed for temporary impacts to WS, because they will be fully restored following completion of construction. Permanent impacts to the East Side Canal would result from the placement of concrete or steel support piles, but would not reduce or impair the ability of the canal to serve its purpose as an agricultural irrigation canal. The limited biological functions and values of the canal are not expected to be reduced due to the placement of these structures. Therefore, no compensatory mitigation is proposed for this minor permanent impact to WS.

Table 3
Impacts to Waters of the State

Feature Identification	Permanent Impacts		Temporary Impacts		Jurisdiction
	(acres)	(linear feet)	(acres)	(linear feet)	
WS 2	—	—	0.01	16	WS
WS 5	—	—	<0.01	4	WS
WS 8	—	—	0.02	25	WS
WS 9	—	—	0.01	22	WS
WS 10	—	—	0.02	18	WS
WS 11	—	—	<0.01	7	WS
WS 14	—	—	<0.01	10	WS
WS 16	0.01	31	<0.01	21	WS
WS 18	0.24	911	0.05	177	WS
WS 19	0.20	1,054	0.01	124	WS
WS 20	—	—	0.32	998	WS
WS 21	—	—	0.23	1,293	WS
WS 22	—	—	0.09	669	WS
WS 24	—	—	0.25	953	WS
WS 25	—	—	— ¹	— ¹	WS
WS 28	—	—	— ¹	— ¹	WS
WS 29	—	—	0.02	50	WS
WS 31	1.40	4,162	<0.01	15	WS
WS 32	2.69	3,587	—	—	WS
WS 33	0.78	1,033	—	—	WS
WS 39	1.35	3,598	—	—	WS
WS 41	0.63	2,288	—	—	WS
WS 42	0.03	166	—	—	WS
WS 43 (East Side Canal)	—	—	0.02	25	WS
WS 44	—	—	<0.01	8	WS
WS 46	0.02	60	0.01	15	WS
WS 47	0.03	111	<0.01	9	WS
WS 50	0.04	61	0.01	15	WS
WS 51	<0.01	8	<0.01	7	WS
WS 52	0.02	58	<0.01	9	WS
WS 54 (East Side Canal)	0.14	210	0.04	53	WS
WS 55	0.11	1,069	0.21	1,358	WS
WS 56	0.21	691	—	26	WS
WS 60	0.20	118	0.02	10	WS
WS 62	—	—	0.82	2,630	WS
WS 66	—	—	0.01	71	WS
WS 67	—	—	0.05	127	WS
Totals²	8.11	19,217	2.23	8,764	

Notes:

¹ Crossings of these features would be constructed using horizontal directional drilling; temporary impacts would only occur in the case of a frac-out.

² Totals include remainders from rounding

1.4 BLOCK 6 – OTHER BEST ACTIONS/BEST MANAGEMENT PRACTICES

The following erosion control measures would be implemented within the Main Project Site:

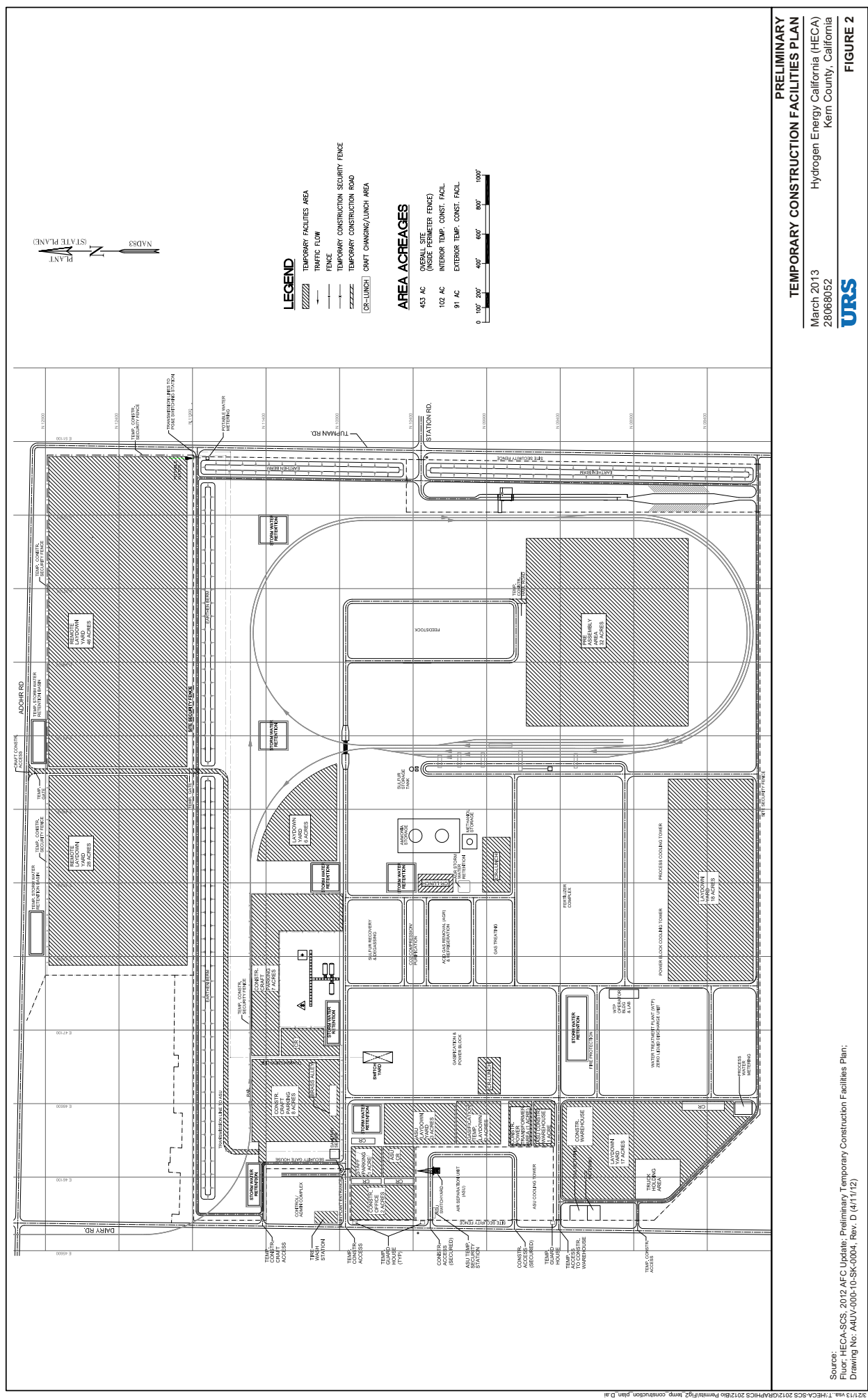
- Strategically placed berms, swales, and culverts will be used to redirect runoff toward the stormwater retention basins.
- Sandbags, filter bales, silt fences, and/or temporary dams will be installed, as needed, to minimize the volume of sediment carried by storm runoff, and to prevent the erosion of slopes and temporary drainage facilities.
- Grades will be designed to prevent the effects of ruts and ponding.
- Following each significant precipitation event, a site review of the effectiveness of the erosion control plan will take place.
- Stormwater will be retained on site for impoundment in the stormwater retention basins; the locations of the basins are shown on Figure 2.

Any work within 100 feet of WUS and/or within 15 feet of WS will incorporate BMPs to minimize fill and/or degradation of waters. BMPs would include the following:

- Signs or other markers would be used to clearly demarcate the extent of work zones.
- Refueling of construction equipment and storage of fuel or other hazardous chemicals would not occur within 50 feet of any jurisdictional water or within 15 feet of nonjurisdictional waters.

BMPs to be implemented during construction activities for installation of the Project Linears include:

- Material excavated from trenches will be stockpiled outside of any canal banks or other water features.
- Excavated trench material will generally be used as backfill.
- Temporarily disturbed canal or other water features will be returned to their pre-construction contours to the extent practicable.
- Energy dissipation devices will be used for discharging water from hydrostatic testing of the pipeline.
- Soil erosion control measures will be implemented, as needed, to prevent runoff and impacts to water quality. Erosion control measures would include sandbags, filter bales, silt fences, and/or temporary dams, as needed, to minimize the volume of sediment carried by storm runoff, and to prevent the erosion of slopes and temporary drainage facilities.



In addition to the above measures, BMPs for HDD will include:

- Installation of silt fencing around the drill sites;
- Selection of drilling fluids for environmental compatibility;
- Removal of spent fluids from the areas immediately adjacent to the water bodies for safe disposal, and to prevent contamination; and
- Implementation of the frac-out response plan, if required.

Reporting on work adjacent to wetlands will be included in the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). The BRMIMP will be prepared as part of the environmental mitigation measures presented in HECA's Amended Application for Certification. A quarterly BRMIMP report will be submitted to the California Energy Commission (CEC), California Department of Fish and Wildlife (CDFW), and United States Fish and Wildlife Service (USFWS).

1.5 BLOCK 8 – CALIFORNIA ENVIRONMENTAL QUALITY ACT

1.5.1 California Environmental Quality Act Documentation

The CEC is the lead agency under the California Environmental Quality Act (CEQA), and DOE is the lead agency under the National Environmental Policy Act (NEPA). The DOE and CEC plan to prepare a joint Environmental Impact Statement/Environmental Impact Report equivalent to satisfy the requirements of both NEPA and CEQA. This document will satisfy the CEQA conditions of certification for the Section 401 Permit. The CEC will provide a copy to the Central Valley Regional Water Quality Control Board, amongst others. Therefore, no CEQA documentation will be submitted with this application package.

1.5.2 State and Federally Threatened/Endangered Species

A number of state and federally Threatened/Endangered Species have the potential to occur in the Project Area (see Table 4). As part of the overall permitting process, a Biological Assessment has been submitted to the USFWS, addressing those species listed under the Endangered Species Act that have the potential to occur. An Incidental Take Permit application will be submitted to the CDFW, addressing potential impacts to species listed under the California Endangered Species Act.

1.6 REFERENCES

Stantec, 2012. Modified CO₂ Supply Line Alignment Data Gap Analysis. April.
(Appendix A-2 of the HECA Project Amended Application for Certification.)

URS, 2013. Biological Assessment, Hydrogen Energy California Project. Prepared for U.S. Department of Energy, Environmental Compliance Division, Pittsburgh, PA. February.

Supplemental Information

Table 4
Listed Species with Potential to Occur¹

Common Name	Scientific Name	State Status	Federal Status
Plants			
California jewel-flower	<i>Caulanthus californicus</i>	Endangered	Endangered
Kern mallow	<i>Eremalche kernensis</i>	None	Endangered
San Joaquin woollythreads	<i>Monolopia congdonii</i>	None	Endangered
Reptiles			
Blunt-nosed leopard lizard	<i>Gambelia sila</i>	Endangered/ Fully Protected	Endangered
Birds			
Swainson's Hawk	<i>Buteo swainsoni</i>	Threatened	None
Mammals			
Buena Vista Lake shrew	<i>Sorex ornatus relictus</i>	Species of Concern	Endangered
Giant kangaroo rat	<i>Dipodomys ingens</i>	Endangered	Endangered
Tipton kangaroo rat	<i>Dipodomys nitratooides nitratooides</i>	Endangered	Endangered
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	Threatened	Endangered
Nelson's Antelope Squirrel	<i>Ammospermophilus nelsoni</i>	Threatened	None

Notes:

¹ Each of the federally listed species is evaluated in the Biological Assessment (URS, 2013), and the state-listed species are evaluated in the CDFW Incidental Take Permit application; not all of the species occur in the project area or would be affected by the proposed project.

**HYDROGEN ENERGY CALIFORNIA
KERN COUNTY, CALIFORNIA**

**APPENDIX A
PROJECT DESCRIPTION**

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List of Acronyms

AFC	Application for Certification
BVWSD	Buena Vista Water Storage District
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CNPS	California Native Plant Society
CO ₂	carbon dioxide
CRP	CO ₂ Recovery Plant
CTB	Central Tank Battery
DOE	U.S. Department of Energy
EHOF	Elk Hills Oil Field
EOR	enhanced oil recovery
HCP	Habitat Conservation Plan
HDD	horizontal directional drilling
HECA	Hydrogen Energy California
KRFCC	Kern River Flood Control Channel
MOU	Memorandum of Understanding
OEHI	Occidental of Elk Hills, Incorporated
PG&E	Pacific Gas and Electric Company
Project	HECA power generating facility
RCF	Reinjection Compression Facility
ROW	right-of-way
syngas	synthesis gas
USFWS	U.S. Fish and Wildlife Service
WKWD	West Kern Water District

1.0 PROJECT DESCRIPTION

Hydrogen Energy California (HECA) LLC is proposing an Integrated Gasification Combined-Cycle polygeneration project (hereafter referred to as the HECA Project). HECA LLC is owned by SCS Energy California LLC. The HECA Project will gasify a 75 percent coal and 25 percent petroleum coke fuel blend to produce synthesis gas (syngas). Syngas produced via gasification will be purified to hydrogen-rich fuel, which will be used to generate low-carbon baseload electricity in a Combined-Cycle Power Block; low-carbon nitrogen-based fertilizer in an integrated Manufacturing Complex; and carbon dioxide (CO₂) for use in enhanced oil recovery (EOR).

The fertilizer and power produced by the HECA Project have a low-carbon footprint, because more than 90 percent of the CO₂ in the syngas is captured and approximately 3 million tons per year of CO₂ is transported via pipeline for use in EOR, which results in simultaneous sequestration (storage) of the CO₂ in a secure geologic formation (HECA, 2012). CO₂ will be transported for use in EOR in the adjacent Elk Hills Oil Field (EHOF), which is owned and operated by Occidental of Elk Hills, Inc. (OEHI) (hereafter referred to as the OEHI Project).

The U.S. Department of Energy (DOE) is providing financial assistance to the HECA Project under the Clean Coal Power Initiative Round 3 via a cost-sharing agreement with HECA LLC, covering project construction and a “Demonstration Period” for the first 2 years of project operations.

The 453-acre HECA Project Site is approximately 7 miles west of the city of Bakersfield, and approximately 2 miles northwest of the unincorporated community of Tupman in western Kern County, California (Figure 1, Project Location). The HECA Project Site is adjacent to the EHOF (Figure 2, Project Vicinity). HECA has an agreement to purchase the HECA Project Site, as well as an additional 653 acres adjacent to the HECA Project Site, herein referred to as the Controlled Area (Figure 3, Project Site Map). The HECA Project Site and Controlled Area are currently used for farming purposes, including the cultivation of cotton, alfalfa, and onions.

In addition to the Project Site, the HECA Project includes construction and operation of five linear facilities, which include (1) an approximately 2-mile-long electrical transmission line to a new Pacific Gas and Electric Company (PG&E) switching station; (2) an approximately 13-mile-long natural gas interconnection with an existing PG&E natural gas pipeline; (3) an approximately 15-mile-long process water supply pipeline from the Buena Vista Water Storage District (BVWSD); (4) an approximately 1-mile-long potable water supply pipeline from West Kern Water District (WKWD); and (5) an approximately 5-mile-long industrial railroad spur that will connect to the San Joaquin Valley Rail Road.

The OEHI Project will include construction and operation of three primary EOR components, including (1) an approximately 3.4-mile-long CO₂ Pipeline from HECA to the EHOF; (2) a CO₂ EOR Processing Facility at the southern terminus of the CO₂ Pipeline; and (3) three Satellite Gathering Stations.

Construction activities associated with each of the HECA and OEHI project components, including avoidance, minimization, and conservation measures, are described below, followed by descriptions of operation and maintenance of the facilities and the project schedule.

1.1 CONSTRUCTION ACTIVITIES

This section describes the construction activities associated with the proposed action. The activities are organized by location.

1.1.1 Power Generating Facility

The 453-acre HECA Project Site is intensively cultivated for the production of alfalfa, cotton, and onions, and has little habitat value for native flora and fauna. In addition, the closest area with habitat value for native flora and fauna is the Kern River Flood Control Channel (KRFCC), approximately 700 feet south of the HECA Project Site. The majority of the 653-acre Controlled Area may remain in active agriculture and act as a buffer between the Project and the KRFCC. The western border of the Tule Elk State Natural Reserve is approximately 1,700 feet to the east of the HECA Project Site.

Construction activities for the HECA Project will occur throughout the 42-month construction period. All construction laydown and parking areas will be within the HECA Project Site and the Controlled Area. Onsite construction activities include clearing and grubbing, grading, hauling, layout of equipment, delivery and handling of materials and supplies, and HECA Project construction and testing operations. The HECA Project Site occurs in an area of relatively flat topography. Site grading will occur as necessary to form level building pads for major process units.

Construction site access will be via Dairy Road for truck deliveries and Adohr Road for construction craft vehicles arriving and departing the site. Initial site preparation will include construction of temporary access roads, parking, laydown areas, office and warehouse facilities, installation of erosion control measures, and other improvements necessary for construction. Erosion control measures will include construction of stormwater retention basins and related site drainage facilities to control runoff within the HECA Project Site boundary. Existing drainage patterns outside the HECA Project Site boundary will remain unchanged, and no runoff from outside the HECA Project Site boundary will flow onto the HECA Project Site.

1.1.2 Electrical Transmission Line

An electrical transmission line will interconnect the HECA Project to PG&E's future switching station. The transmission line will be constructed and owned by HECA up to the point of interconnection. The power generated by the HECA Project will be connected to the existing PG&E system by a single-tower, 230-kilovolt transmission line that will be constructed as part of the HECA Project. This single-circuit line will be connected to a new switchyard at the HECA Project Site.

The proposed electrical transmission line route is approximately 2 miles long to HECA's property boundary, and passes through previously disturbed areas or active agriculture, predominantly pistachio orchards, alfalfa, and cotton. Construction of the line will require installing approximately 26 (15 offsite and 11 onsite) tubular-steel transmission structures and the supporting foundations.

The electrical transmission line route extends east from the HECA Project Site to a new PG&E switching station (adjacent to the existing Midway-Wheeler Ridge transmission lines) as shown on Figure 4, Project Location Details. The new PG&E switching station will be constructed at the eastern terminus of the electrical transmission line, approximately 2 miles east of the HECA Project Site and next to Elk Valley Road. Access to the switching station site would be along an existing unimproved farm road from Morris Road or Elk Valley Road. The electric transmission switching station will be designed, constructed, owned, and operated by PG&E.

The area occupied by the PG&E switching station will be approximately 417 feet by 417 feet. Portions of the site will be excavated to install a grounding grid, underground control and protection cabling, and foundations. It is anticipated that “dead-end” structures to terminate the transmission line from the HECA site would be approximately 30 feet tall near the western end of the switching station site. A similar set(s) of structures at the eastern end of the station for the incoming lines from Midway and the outgoing lines to Wheeler Ridge would also be required. The height of a two-level structure would be on the order of 50 to 60 feet tall. The station would also have structures associated with interconnecting buses and cable “drops” to the circuit breakers. The height of these structures would be on the order of 20 to 30 feet.

Approximately 15 steel poles are expected to be required outside of the HECA Project Site. Construction of the interconnection line will consist of installing footings, poles, insular and hardware, and pulling conductor and shield wires. The new transmission line interconnection will be placed in an approximately 100-foot-wide permanent right-of-way (ROW).

Construction of the new 230-kilovolt transmission line interconnection will require approximately 3 months. It will be scheduled for completion and be operational in time for generation testing of the HECA Project. HECA will provide for the transmission line via a Large Generator Interconnection Agreement up to the point of interconnection at the future PG&E switching station.

Upon completion of the linear installation, agricultural uses may be reestablished along the linear route within the 100-foot-wide permanent ROW. Orchards would be limited to 25 feet in height within the permanent ROW.

1.1.3 Natural Gas Supply

A 13-mile natural gas linear will interconnect with a PG&E natural gas pipeline north of the HECA Project Site. The interconnect will consist of one tap off the existing natural gas line, and one metering station at the beginning of the natural gas linear adjacent to a PG&E Inlet. The metering station will be up to 100 feet by 100 feet, and 8 feet tall, surrounded by a chain-link fence. In addition, there will be a metering station at the end of the natural gas linear, on the western side of the HECA Project Site, and a pressure-limiting station on the HECA Project Site. PG&E will construct and own the natural gas pipeline.

The majority of the natural gas linear extends across areas used for active agriculture and existing roadways. However, the natural gas linear is adjacent to several areas with natural habitat value near Interstate 5 and at the northern terminus near Magnolia Avenue.

The natural gas linear would require a 50-foot construction ROW and a 25-foot permanent ROW; however, most of the ROW would be located within cultivated fields or other disturbed habitat types adjacent to paved and unpaved roads.

Wetland features adjacent to the proposed natural gas linear ROW will be avoided. Non-wetland potential waters of the United States within the natural gas pipeline construction limits are degraded, seasonally ponded claypan depressions. If avoidance of non-wetland waters is not feasible, the feature(s) will be temporarily disturbed by the construction activities during installation of the natural gas pipeline, and the site will be restored to pre-construction condition.

Construction of the natural gas pipeline interconnection will involve a variety of crews performing the following typical pipeline construction activities: hauling and stringing the pipe along the route; welding, radiographic inspection, and coating the pipe welds; trenching; lowering the pipe into the trench; backfilling the trench; hydrostatic testing of the pipeline; tying into the existing pipeline; purging the pipeline; and cleaning up and restoring construction areas. Roads and ROWs will be restored to specifications of the involved agencies. Open trenching will be minimized, and trenches will be covered or ramped when left overnight. In areas with habitat value and in agricultural areas, the topsoil from the trenching will be set aside, preserved, and used to cover the excavation.

Construction of the natural gas pipeline interconnection will take approximately 6 months. It will be scheduled to be finished and operational in time to provide test gas to the HECA Project. Construction will occur in accordance with a traffic management plan to minimize impacts to traffic traveling on the affected roadways. Affected areas will be restored to their original state so as to minimize erosion.

1.1.4 Water Supply Pipelines

For process water, the HECA Project will use brackish groundwater supplied by the BVWSD via a new 15-mile pipeline. Potable water for drinking and sanitary use will be supplied by WKWD, who will construct a new 1-mile pipeline for that purpose. Installation of the process water and potable water pipelines will involve industry standard construction activities for pipelines, including trenching; hauling and stringing of pipe along the routes; welding; radiographic inspection and coating of pipe welds; lowering welded pipe into the trench; hydrostatic testing; and backfilling and restoring the approximate surface grade. Construction of the water pipelines is expected to take approximately 6 months to complete.

Process Water Supply Pipeline

For process water, the HECA Project will use a new 15-mile, 30-inch-diameter pipeline that will convey brackish groundwater supplied by the BVWSD. BVWSD will construct and own the process water supply pipeline, approximately 14.5 miles of which will be located in an existing BVWSD ROW. The proposed process water pipeline would be constructed entirely within an existing unpaved road or within areas that are currently actively farmed, and therefore, no direct impacts to natural habitats are anticipated. Once the process water is delivered to the HECA Project Site, the brackish water will be treated on site to meet all process and utility water

requirements. The process water supply pipeline will be approximately 15 miles in length and will be constructed by BVWSD.

In addition, BVWSD will own, construct, operate, and maintain the well field that will provide brackish groundwater for the HECA Project's process water supply. This well field will be in the northwestern portion of BVWSD's service area within active agricultural fields near the West Side Canal, in the vicinity of Seventh Standard Road, at the northern end of the 15-mile-long process water line. It is currently anticipated that there will be up to five groundwater extraction wells. Two of these wells will provide operational redundancy. The maximum depth of the wells will be approximately 300 feet below ground surface. The brackish water will be treated at the Project Site to meet all process and utility water requirements. The process water supply pipeline would require a 50-foot construction ROW and a 25-foot permanent ROW.

BVWSD addressed the groundwater extraction wells and the process water supply pipeline in their Draft and Final Environmental Impact Reports for BVWSD's Groundwater Management Program, issued in October 2009 and December 2009, respectively (BVWSD, 2009a; 2009b). The Final Environmental Impact Report for the Groundwater Management Program (State Clearinghouse No. 2009011008) concludes that the wells and the process water pipeline do not result in significant impacts to any federally listed species.

Potable Water Pipeline

For drinking and sanitary use, the HECA Project will use potable water supplied by WKWD. A new 4-inch-diameter potable water line will be constructed, owned, and maintained by HECA LLC.

The potable water line would be approximately 1 mile in length. This pipeline will require a 10-foot construction and permanent ROW that will be placed within the proposed electrical transmission line ROW. Most of the proposed ROW is within or adjacent to existing dirt access roads, or in cultivated fields.

1.1.5 Industrial Railroad Spur

The industrial railroad spur is approximately 5 miles long and will connect the HECA Project Site to the existing San Joaquin Valley Railroad Buttonwillow Branch (formerly called the SP Buttonwillow Branch). Two public at-grade crossings may be required, and several private crossings will be needed for farmers' access to croplands and the irrigation canal. The industrial railroad spur would require a 75-foot construction ROW, 60-foot permanent ROW, and 3-acre rail laydown area.

1.1.6 OEHI Carbon Dioxide Pipeline

An approximately 3.36-mile-long, 12-inch-diameter CO₂ pipeline will be constructed to transfer the CO₂ from the HECA Project Site to the OEHI CO₂ Processing Facility used by OEHI for injection into deep underground hydrocarbon reservoirs for CO₂ EOR and sequestration. Additional components of the CO₂ pipeline will include metering facilities at the pipeline origin and terminus, a cathodic protection system, and four emergency block valves. Two of the block valves will be automated and two will be manual block valves.

The CO₂ pipeline route originates at the southern portion of the HECA Project Site and will be constructed using a combination of standard open-trench installation and horizontal directional drilling (HDD). One HDD will be approximately 500 feet in length under the levees associated with the West Side/Outlet Canal crossing. A second HDD will be approximately 2,000 feet long, and will be used to install the pipeline under the KRFCC and the California Aqueduct. On the southern side of the Aqueduct, the pipeline alignment extends southeast and south to the OEHI CO₂ Processing Facility, and parallels existing private roads. OEHI will construct and own the pipeline.

With the exception of HDD crossings where the depth of the CO₂ pipeline may reach 100 feet below grade, the CO₂ Pipeline will be buried approximately 5 feet below grade. Installation of the CO₂ supply pipeline will involve typical construction activities, including trenching; hauling and stringing pipe along routes; welding; radiographic inspection and coating pipe welds; lowering welded pipe into the trench; backfill of the trench; hydrostatic testing of the pipeline; purging the pipeline; and cleanup and restoration of construction areas. Grade cuts will be restored to their original contours, and affected areas will be restored to their original condition to minimize erosion. The pipeline will be protected by cathodic protection, and monitored by independent leak-detection systems.

Construction of the CO₂ pipeline is expected to take approximately 6 months to complete. The CO₂ pipeline would require a 50- to 80-foot construction ROW and a 25-foot permanent ROW.

HDD involves using a drilling rig that will bore a horizontal hole under water crossings. At each of these crossings, a laydown area (or entry/exit pit) has been identified on either side of the water course to accommodate the HDD installation (see Figure 4, Sheet 4, Project Location Details). The temporary disturbance area would be approximately 120 feet by 100 feet for each HDD entry pit; and approximately 75 feet by 100 feet for each HDD exit pit (Stantec, 2012).

Best management practices for HDD will include silt fencing around the drill sites, energy dissipation devices for discharging water from hydrostatic testing of the pipeline, selecting drilling fluids for environmental compatibility, and removing spent fluids from the areas immediately adjacent to the water bodies for safe disposal and to prevent contamination. In addition, soil erosion control measures will be implemented to prevent runoff and impacts to water quality.

1.1.7 OEHI Carbon Dioxide EOR Processing Facility

The CO₂ from the HECA plant will be received by the CO₂ EOR Processing Facility, which will be located at the southern terminus of the CO₂ Pipeline in the southeastern quarter of Section 27S. The CO₂ EOR Processing Facility will include the Central Tank Battery (CTB), Reinjection Compression Facility (RCF), CO₂ Recovery Plant (CRP), and a Water Treatment Plant. The CO₂ EOR Processing Facility is expected to occupy and permanently disturb an area of 1,200 feet by 2,200 feet (60.61 acres).

Central Tank Battery

The CTB is the primary oil/water separation system for the CO₂ EOR process. The inlet liquid gathering lines from the Satellite Gathering Stations will be manually directed to one of the three gas separator tanks. The gas from this process will be combined with the gas from the gas separators. The oil and water will be separated, and the oil will be skimmed off and pumped to Section 18G and metered for sale. The partially treated water will be conveyed via pipeline to the existing water treating facilities.

Water Treatment Plant

The oily water from the inlet section of the CTB will be treated to remove oil, solids, and other contaminants from the produced water. The produced water will be pressurized in the injection pumps and sent to the satellites for injection. Low-pressure gas collected from the CTB will be compressed and then routed to the inlet of the RCF and the CRP for processing.

Reinjection Compression Facility

The RCF will be the first portion of the CO₂ treating/recovery facilities to be installed. Produced gas from the Satellite Gathering Stations (see Section 1.1.8) will initially flow to the RCF. At the RCF, the CO₂ gas will be dehydrated, compressed, blended with CO₂ purchased from the HECA Project, and re-injected into a closed-loop system.

CO₂ Recovery Plant

The CRP is the second part of the gas treating/recovery plant. This facility will separate CO₂ from produced hydrocarbon gas and recycle the separated CO₂. The CRP will consist of several processing units for the separation of the CO₂ from the recovered natural gas. The CRP is not expected to be constructed until 2020, and would not be part of the Demonstration Period defined by DOE.

1.1.8 OEHI Satellite Gathering Stations

The Satellite Gathering Stations (satellites, also known as Production/Well-Testing Satellites) will be a series of facilities that will provide primary separation of the oil/water and gas from the production well stream. Initially, three satellites are scheduled to be installed to handle the expected production for the first several years of the field development during the Demonstration Period. Satellites 1, 2, and 3 are each expected to have a permanent surface footprint of 230 by 200 feet. This footprint is included in the total area of the OEHI Project site evaluated in the Biological Assessment.

Each satellite will be equipped with an inlet manifold in which well flow lines associated with that satellite are connected. Flow from each well flow line will be diverted into either the production separator or the test separator via automated manual valves. The production separator is a two-phase separator to handle primary vapor liquid separation of the fluid recovered from the production wells at each satellite. The gases will be separated and routed to

the inlet of the RCF. The entire field production pressure will be controlled at the RCF inlet header, and the individual satellites will “float” on that pressure.

Liquid and gas flow rates will be metered for production trending and monitoring. The test separator will be a three-phase, bucket and weir separator to allow for a 24-hour test cycle of each well serviced by that satellite. The oil and water will be controlled by level control, and the gas will be controlled by a back-pressure controller to hold the test separator pressure slightly above that of the associated production separator. Oil, water, and gas from the test separator will be re-combined and directed to the inlet manifold and then to the production separator.

1.2 OPERATION AND MAINTENANCE

This section describes the operation and maintenance of the HECA and OEHI projects.

1.2.1 HECA Project

HECA Project operation and maintenance will occur within the HECA Project Site. The adjacent Controlled Area will remain in active agriculture similar to the existing condition. Access to linears will be limited in nature, and will be along existing access roads or access roads developed during initial installation activity. HECA LLC will own, operate, and maintain the approximately 2-mile transmission line up to the interconnection with a future PG&E switching station. It is anticipated that annual maintenance of the electrical transmission line will be provided for under an agreement between PG&E and the Project. The electrical transmission line is located entirely within areas that are actively farmed or are developed. Most of the maintenance will be routine and can be scheduled during periods when damage to the crops and land can be minimized. Maintenance activities will be conducted by personnel trained to be aware of the presence of sensitive wildlife.

PG&E will own, operate, and maintain the natural gas pipeline. Maintenance of the natural gas pipeline would follow PG&E corporate policies and protocols. Long-term maintenance needs of the natural gas pipeline would be minimal during the 25-year lifespan of the Project; therefore, they are not quantified in this document.

BVWSD will own, operate, and maintain the approximately 15-mile-long, 30-inch-diameter process water pipeline and associated wells. Annual maintenance of the process water pipeline and associated groundwater wells would be conducted by BVWSD. Maintenance activities of the wells and the pipeline would follow BVWSD corporate policies and protocols. Long-term maintenance needs of the process water pipeline would be minimal during the 25-year lifespan of the Project, and therefore is not quantified in this document.

HECA LLC will own, operate, and maintain the approximately 1-mile potable water pipeline. Maintenance activities of the pipeline would include:

- Annual reconnaissance of the pipeline ROW;
- Annual inspection and exercising (opening and closing for one cycle) of valves, as necessary;

- Annual vegetation removal, re-grading, and application of dirt for the access road after wet periods and pipe work, as necessary; and
- Replacement of pipeline components (lining and coating, valves, and joints), as determined necessary by routine inspection.

Long-term maintenance needs of the potable water pipeline would be minimal during the 25-year lifespan of the HECA Project; therefore, they are not quantified in this document.

HECA LLC currently anticipates that it will own, operate, and maintain the approximately 5-mile railroad spur. Regardless of final ownership of the spur, maintenance activities will consist of routine annual maintenance activities and programmed maintenance conducted on a periodic basis. Annual maintenance activities consist of visual inspections, vegetation control, spot surfacing and lining of rough spots in the track, and adjusting/lubrication of turnouts. In addition, any warning devices at road crossings will be inspected as frequently as monthly.

Programmed major maintenance consists of surfacing and lining the rail line, typically every 3 to 5 years; replacing the rail, potentially once during the life of the HECA Project; and replacing 15 percent of the timber ties on a 10-year cycle. If concrete ties are used, the ties will not need to be replaced. Major maintenance activities will be conducted using on-track equipment. Replaced materials will be removed from the ROW and recycled. Timber ties will be disposed of by incineration, landfill disposal, or other approved disposal options.

1.2.2 OEHI Project

OEHI will own, operate, and maintain the CO₂ pipeline and the related components of the OEHI Project. Maintenance of the CO₂ pipeline and other EOR facilities will follow existing OEHI operational procedures, as required by the existing U.S. Fish and Wildlife Service (USFWS) Biological Opinion and the related 1997 Memorandum of Understanding (MOU) between OEHI and the California Department of Fish and Game (CDFG) that has twice been updated, and remains in effect until 2014 (CDFG, 1997; 1999; 2010). The EOR facility operations will be similar to the existing facility operations by OEHI at the EHOE. Operations activities include facility inspection and maintenance. Maintenance needs of the CO₂ pipeline and associated EOR facilities would be minimal during the Demonstration Period of the Project; therefore, they are not quantified in this document.

1.3 PROPOSED CONSERVATION MEASURES

This section describes the conservation measures that are included in the HECA Project and the OEHI Project to avoid, minimize, and/or compensate for impacts on listed species.

1.3.1 HECA Project Design Modifications

The HECA Project design has been refined in coordination with the resource agencies and environmental specialists to avoid and minimize impacts on sensitive biological resources to the extent practicable. These measures include relocating the HECA Project Site from the originally proposed location to its current location across the Aqueduct to reduce impacts to the blunt-nosed leopard lizard; and relocating the natural gas pipeline to avoid portions of the Coles Levee Ecosystem Preserve. In addition, the potable water linear and electrical transmission linear were

shortened and relocated to the east of the HECA Project Site, which avoided impacts to 1.9 acres of Allscale Scrub habitat.

The HECA Project also includes general and species-specific measures to avoid and minimize impacts on listed species and their habitat. For potential impacts on listed species that remain after implementation of feasible avoidance and minimization measures, comprehensive compensatory measures through habitat enhancement, establishment, and preservation are included in the Project to offset potential losses of listed species or their habitat. HECA LLC is committed to implementing these measures as part of the Project. These conservation measures are extracted from the Amended Application for Certification (AFC) submitted to the California Energy Commission (CEC) in May 2012, and the corresponding numbers or mitigation measures from the 2012 Amended AFC (e.g., BIO-1, BIO-2, etc.) are provided where applicable.

1.3.2 OEHI Project Design

The proposed CO₂ pipeline crossings of the West Site Canal/Outlet Canal, the KR FCC, and the California Aqueduct will be constructed using HDD to avoid direct and indirect effects to species movement and dispersal at these locations.

OEHI will minimize impacts associated with the OEHI Project by using existing wells and previously disturbed areas to the maximum extent feasible. Avoidance and minimization will also be achieved by minimizing future land disturbance on those portions of the EHOFF considered high value on the Habitat Conservation Plan (HCP) multi-species map. The OEHI Project will also be implemented in compliance with the 1995 Biological Opinion issued by the USFWS, and a related 1997 MOU between OEHI and the CDFG, as updated. Finally, the OEHI Project will be implemented in compliance with a 50-year HCP for the EHOFF, which is currently under development and anticipated to be approved by the end of 2013.

1.4 PROJECT SCHEDULE

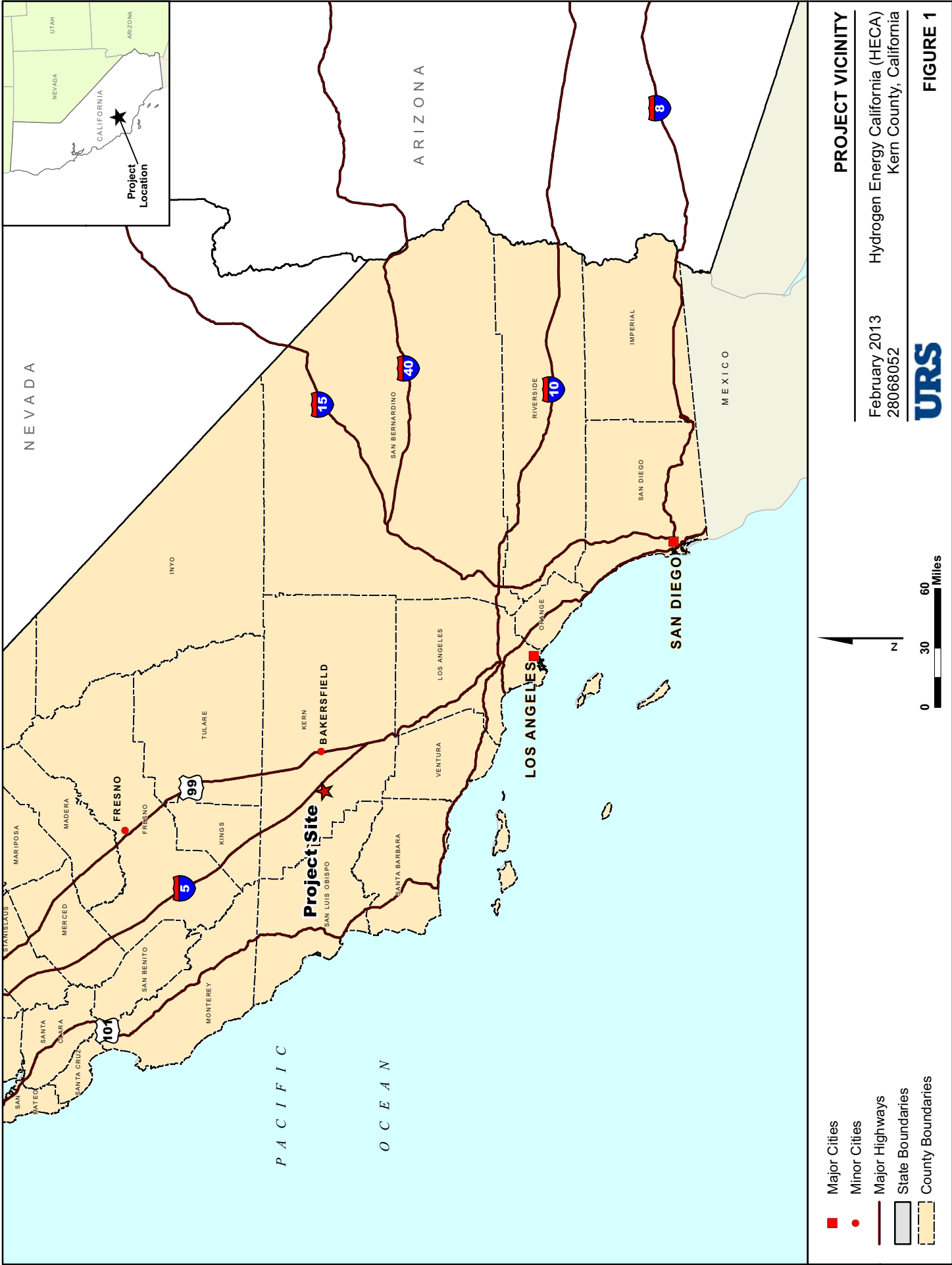
The anticipated schedule milestones for the Project are as follows:

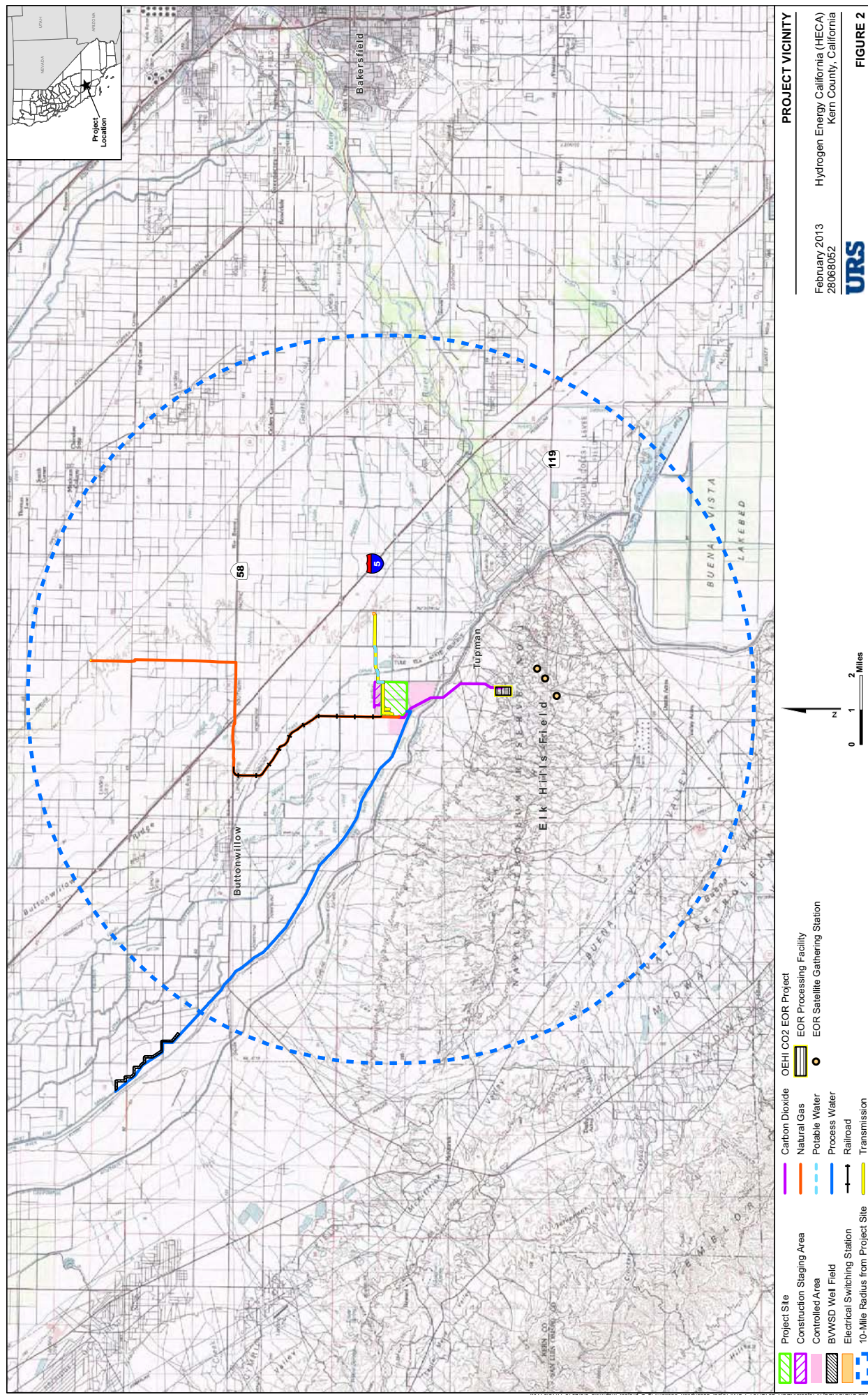
USFWS finalizes Biological Opinion	May 2013
Completion of CEC permitting process	late 2013
Commencement of pre-construction and construction activities.....	late 2013
Commencement of commercial operation of the Project.....	2017

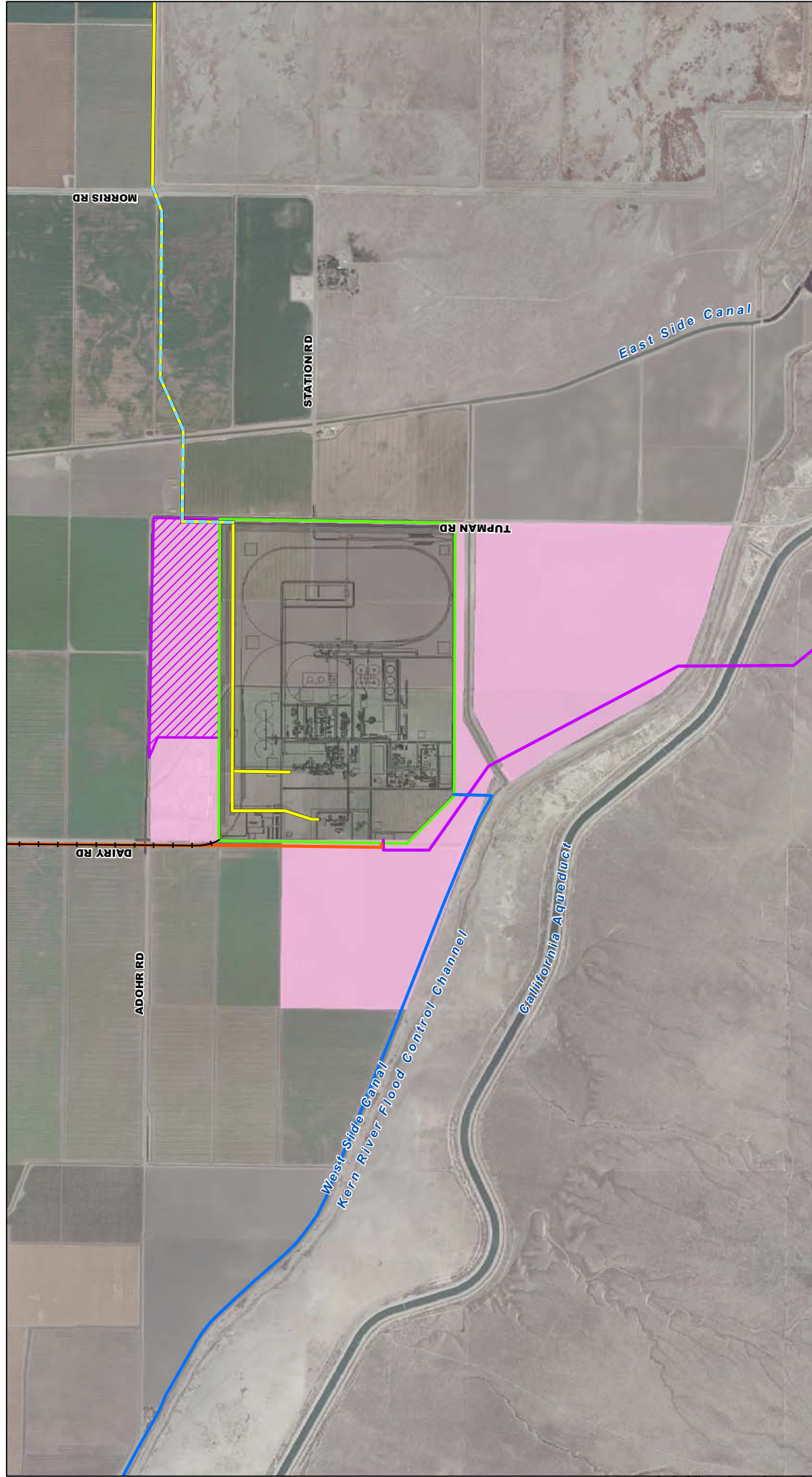
2.0 REFERENCES

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- BVSWD (Buena Vista Water Storage District), 2009b. Final Environmental Impact Report for the Buena Vista Water Storage District Buena Vista Water Management Program (State Clearinghouse No. 2009011008). Buttonwillow, California. December 2009.
- HECA (Hydrogen Energy California) LLC, 2012. Amended Application for Certification for Hydrogen Energy California, Kern County, California. Submitted to the California Energy Commission. Prepared by URS Corporation. May 2012.
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- USFWS (U.S. Fish and Wildlife Service), 1999. Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to Ground Disturbance. URL: http://www.fws.gov/sacramento/es/documents/kitfox_standard_rec.pdf.

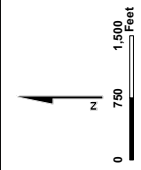
FIGURES







- Project Site
- Construction Staging Area
- Controlled Area
- Carbon Dioxide
- Natural Gas
- Potable Water
- Process Water
- Railroad
- Transmission



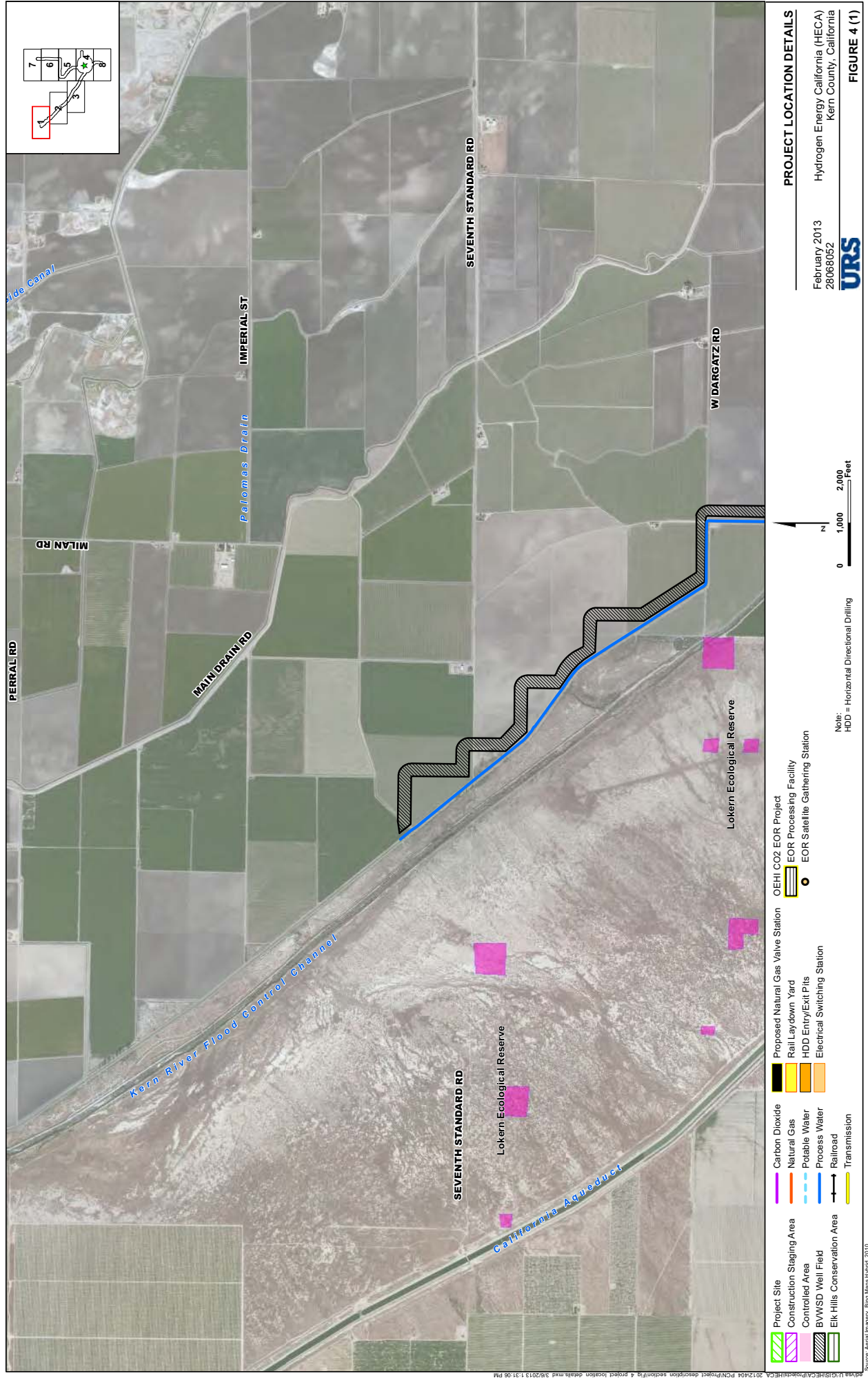
PROJECT SITE MAP

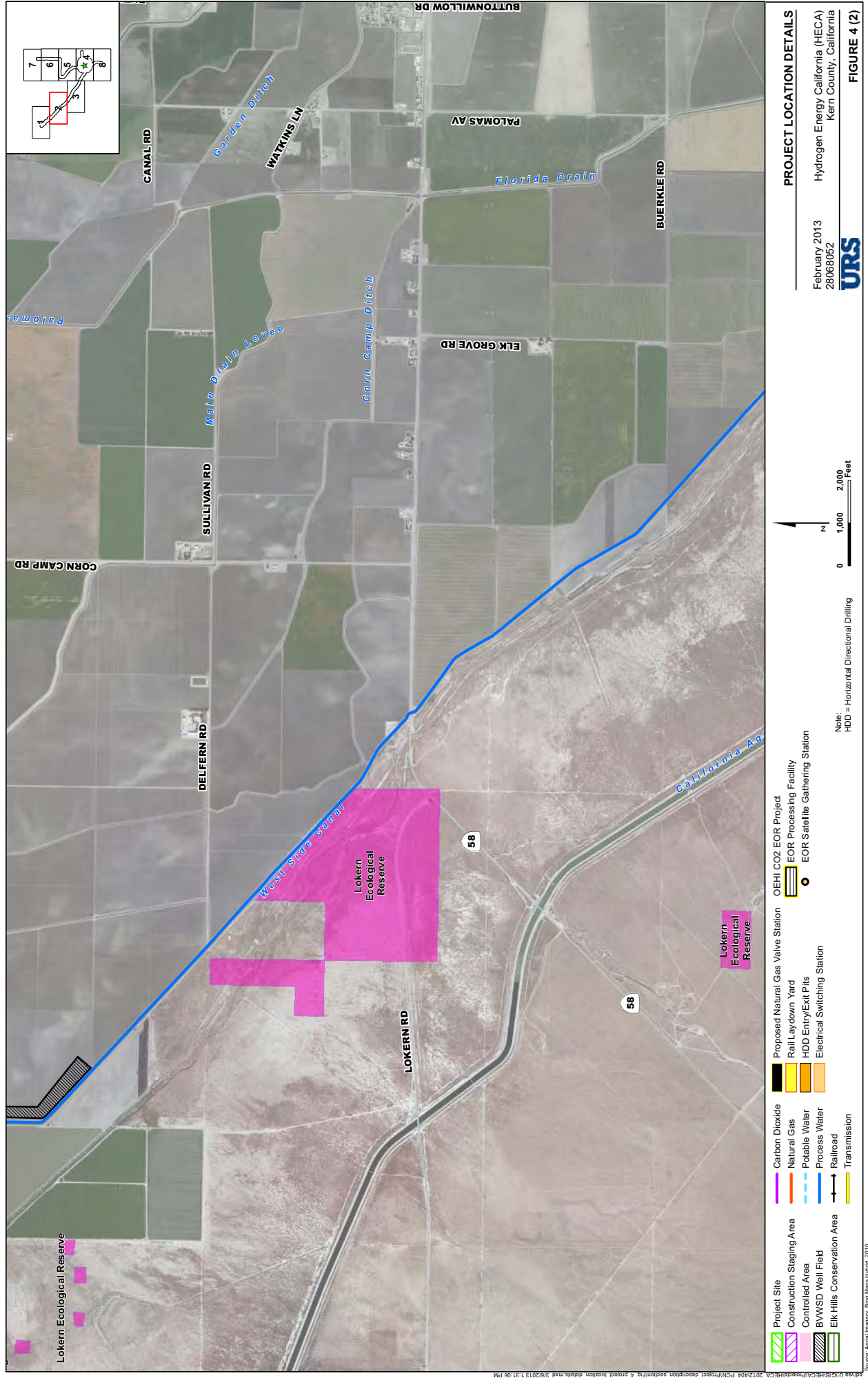
February 2013
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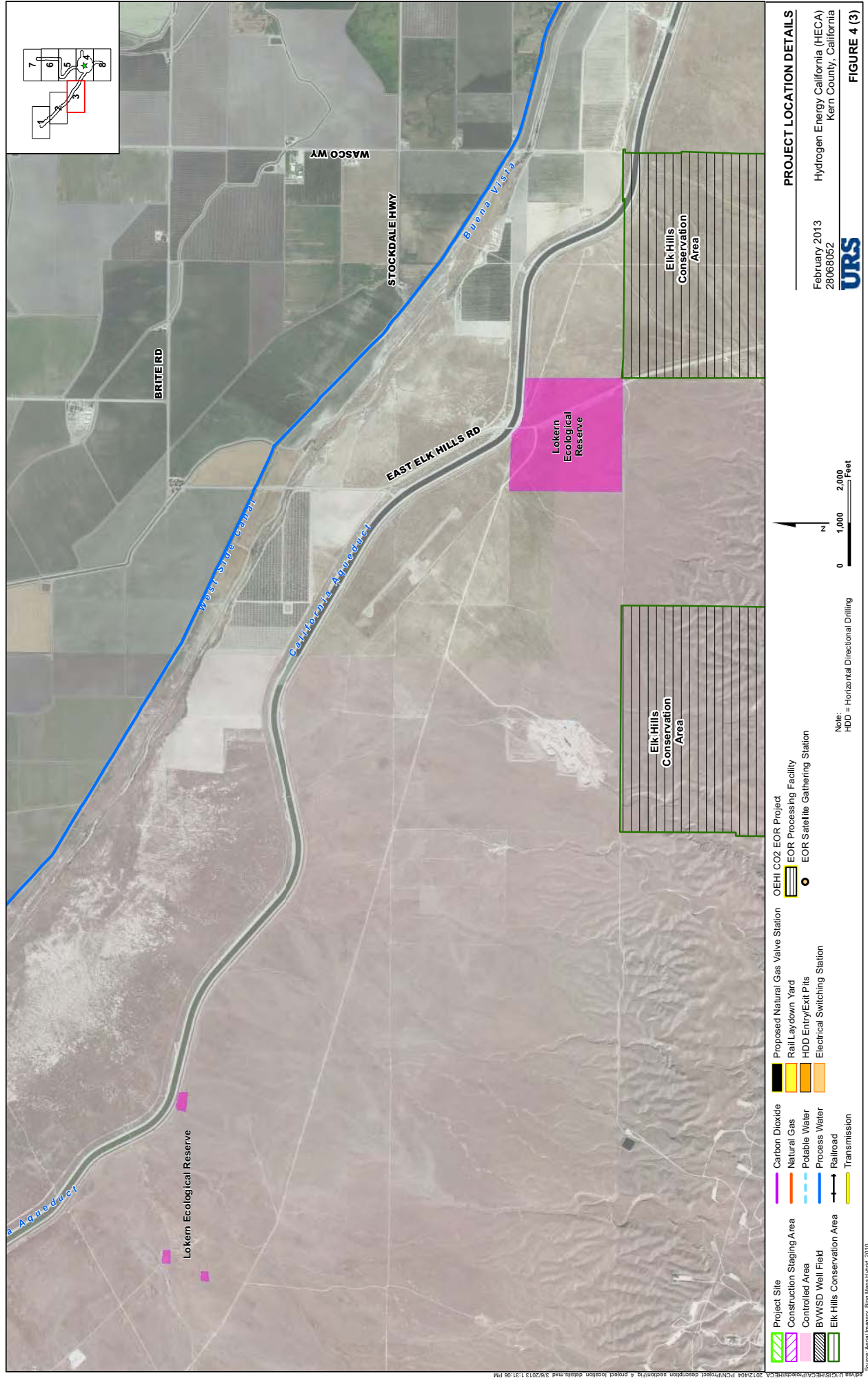
Hydrogen Energy California (HECA)
Kern County, California

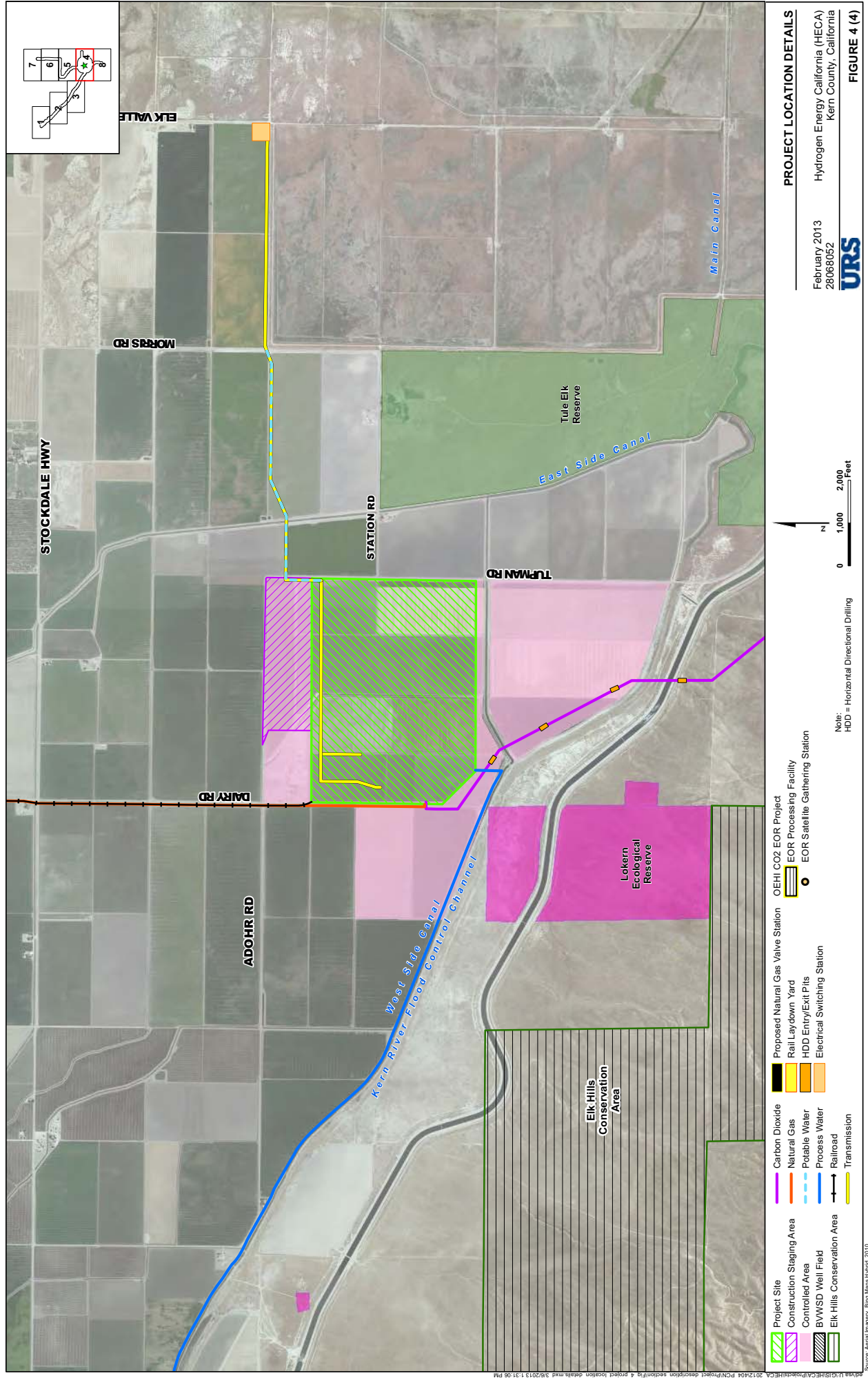
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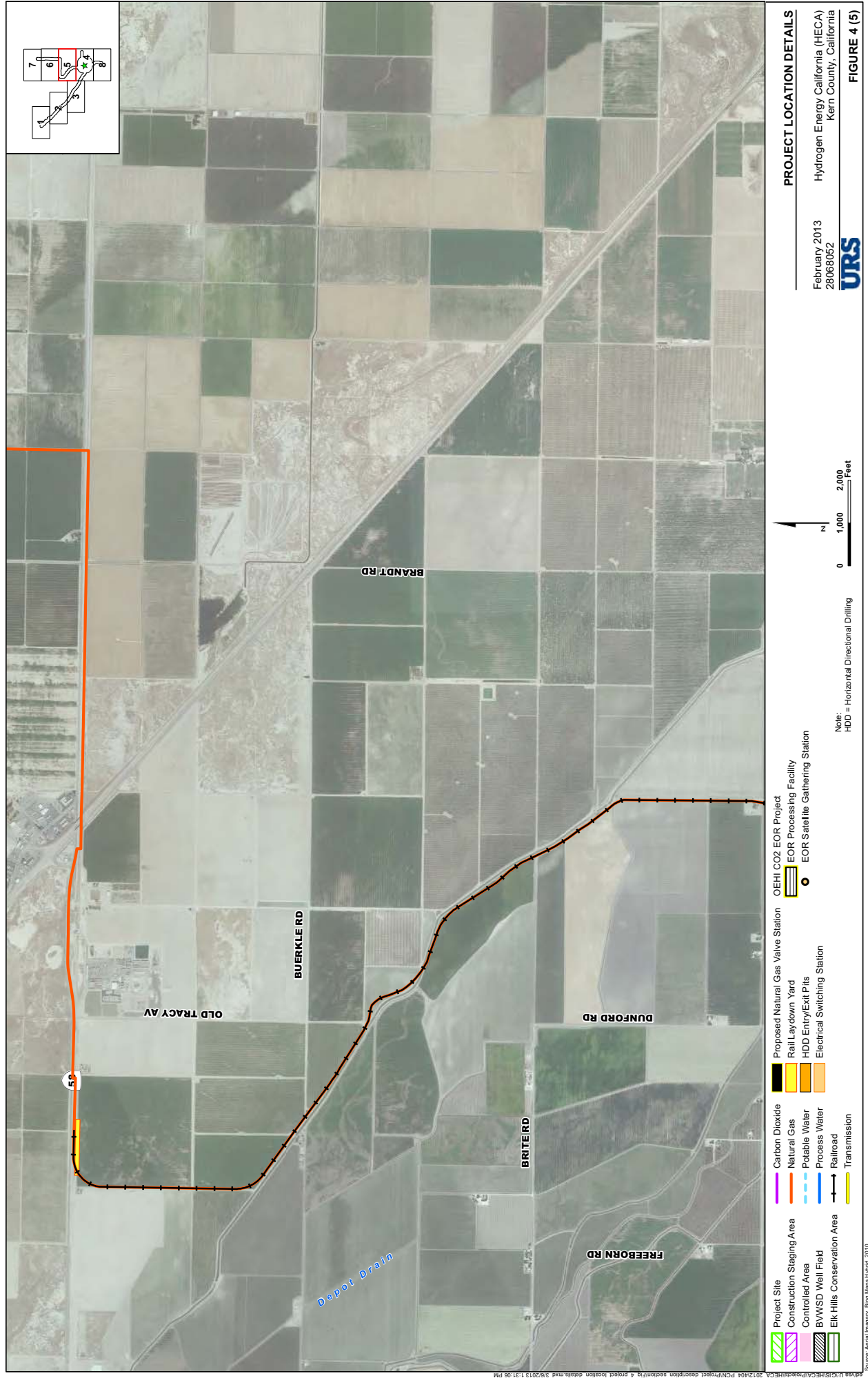
FIGURE 3

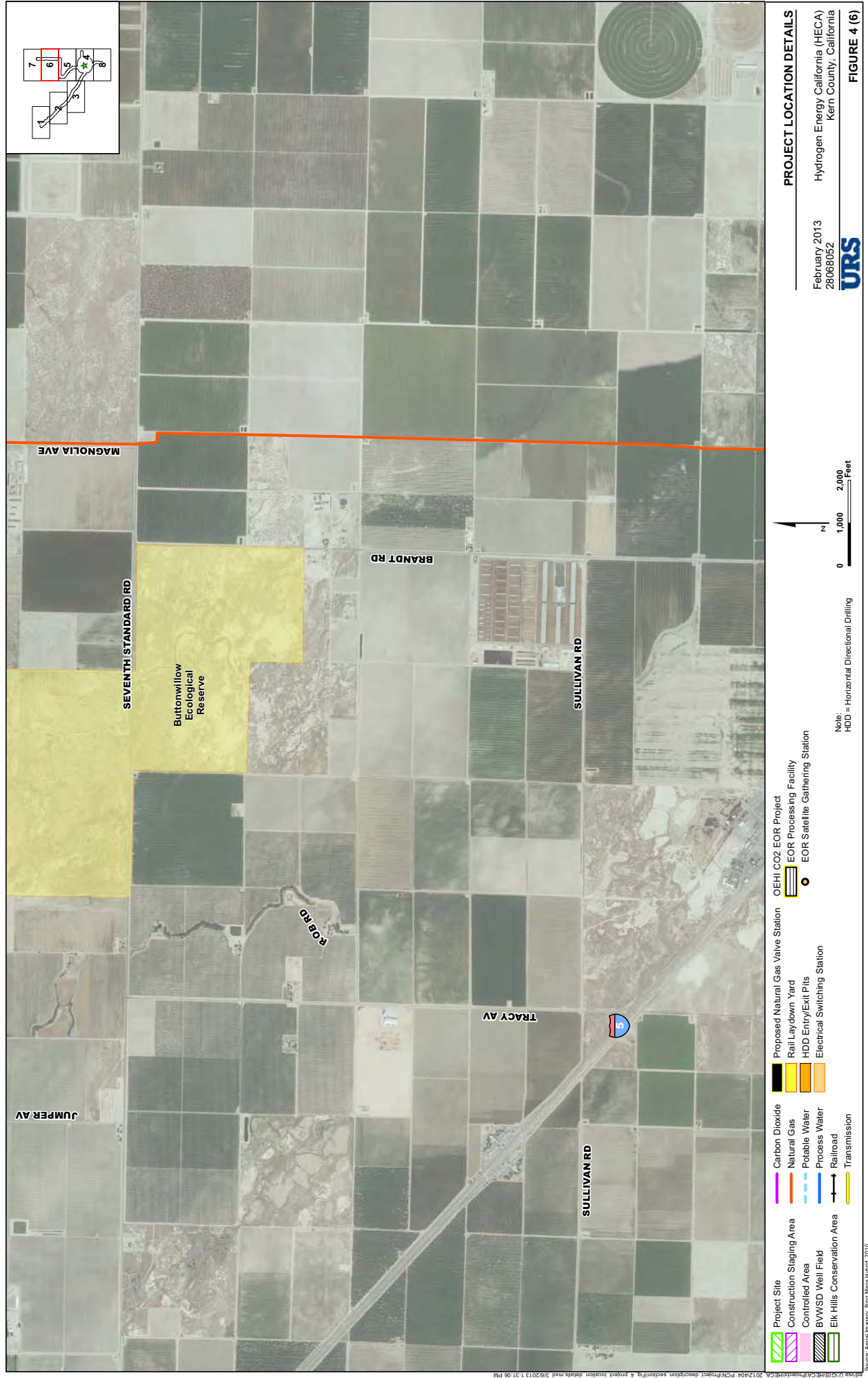


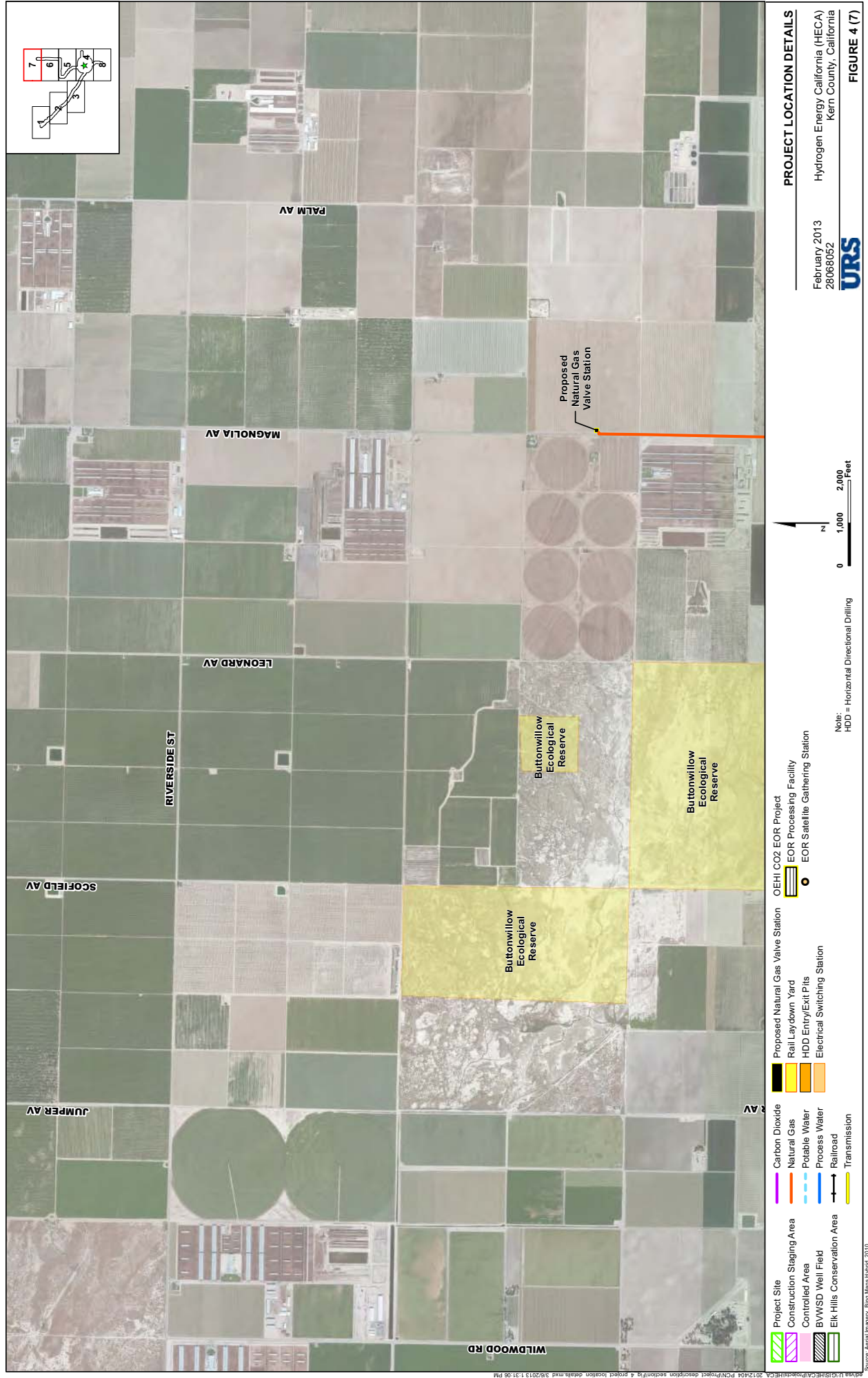


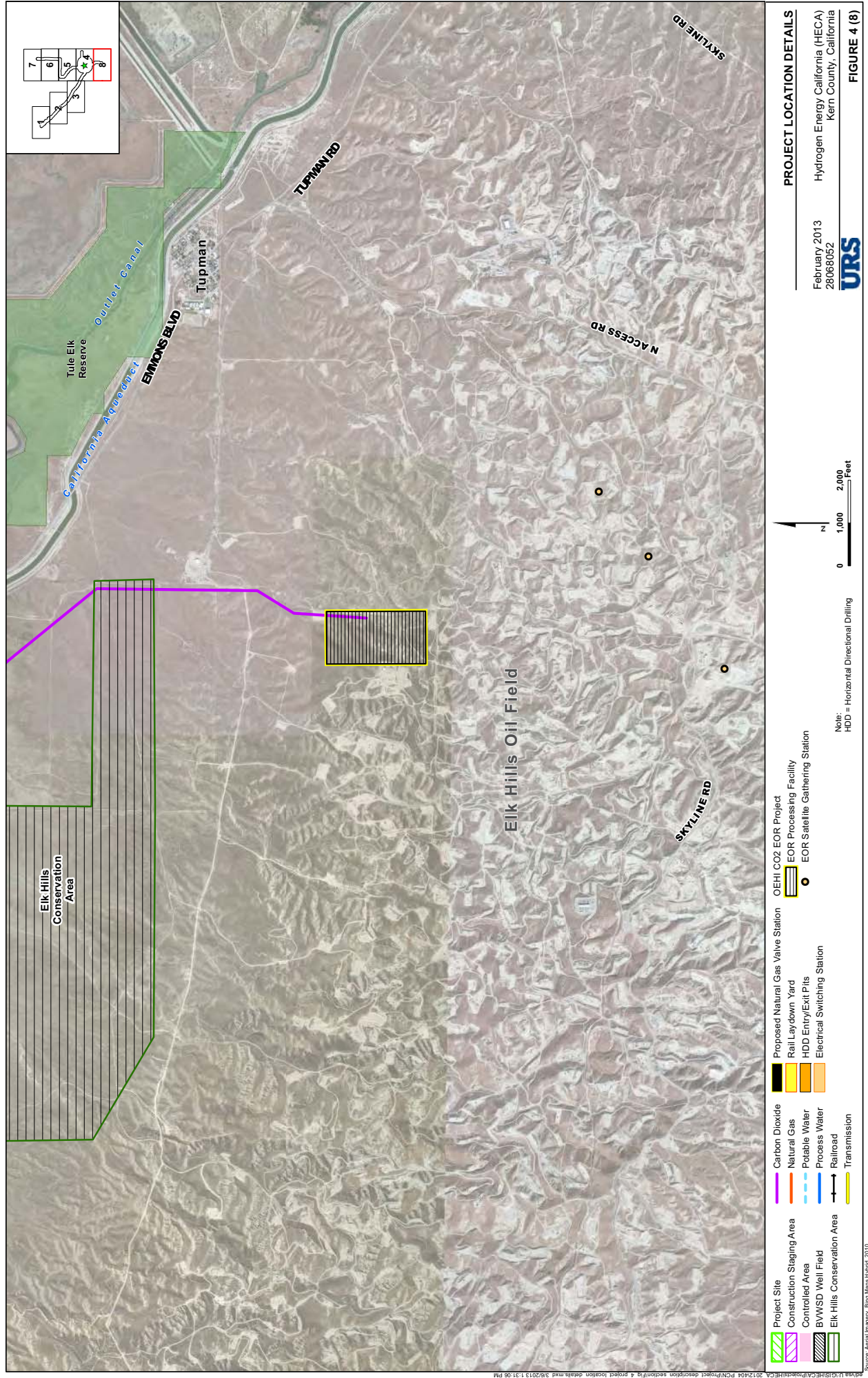












Appendix B
Jurisdictional Delineation
(provided separately)



**BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV**

**AMENDED APPLICATION FOR CERTIFICATION
FOR THE HYDROGEN ENERGY
CALIFORNIA PROJECT**

**Docket No. 08-AFC-08A
PROOF OF SERVICE
(Revised 3/4/13)**

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CONVENIENCE ONLY):**

***After docketing, the Docket Unit
will provide a copy to the persons
listed below. Do not send copies of
documents to these persons
unless specifically directed to do
so.***

KAREN DOUGLAS
Commissioner and Presiding Member

ANDREW McALLISTER
Commissioner and Associate Member

Raoul Renaud
Hearing Adviser

Galen Lemei
Adviser to Presiding Member

Jennifer Nelson
Adviser to Presiding Member

*Hazel Miranda
Adviser to Associate Member

David Hungerford
Adviser to Associate Member

Patrick Saxton
Adviser to Associate Member

Eileen Allen
Commissioners' Technical
Adviser for Facility Siting

DECLARATION OF SERVICE

I, Dale Shileikis, declare that on May 3, 2013, I served and filed copies of the attached Supplemental Response to CEC Data Request: No. A54, dated May, 2013. This document is accompanied by the most recent Proof of Service, which I copied from the web page for this project at: http://www.energy.ca.gov/sitingcases/hydrogen_energy/.

The document has been sent to the other persons on the Service List above in the following manner:

(Check one)

For service to all other parties and filing with the Docket Unit at the Energy Commission:

 X I e-mailed the document to all e-mail addresses on the Service List above and personally delivered it or deposited it in the US mail with first class postage to those persons noted above as "hard copy required";
OR

 Instead of e-mailing the document, I personally delivered it or deposited it in the US mail with first class postage to all of the persons on the Service List for whom a mailing address is given.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that I am over the age of 18 years.

Dated: 5/3/13